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September 10, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 10, 1985 Volume 1058 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

May 7, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 7, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,347,629 through 4,348,773

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,396,738, Re. S.N. 759,910, Filed July 29, 1985, Cl. 524/228, AQUEOUS ADHESIVE COMPOSITIONS, Clois E. Powell, et al., Owner of Record: *Ashland Oil, Inc., Ashland, Ky.*, Attorney or Agent: Jerry K. Mueller, Jr., et al., Ex. Gp.: 155

4,401,767, Re. S.N. 758,752, Filed July 25, 1985, Cl. 501/019, SILVER-FILLED GLASS, Raymond L. Dietz, et al., Owner of Record: *Johnson Matthey, Inc., Malvern, Pa.*, Attorney or Agent: John W. Malley, et al., Ex. Gp.: 118

4,417,831, Re. S.N. 757,603, Filed July 22, 1985, Cl. 405/227, MOORING AND SUPPORTING APPARATUS AND METHODS FOR A GUYED MARINE STRUCTURE, Philip A. Abbott, et al., Owner of Record: *Brown and Root, Inc., Houston, Tex.,* Attorney or Agent: John A. Lahive, Jr., et al., Ex. Gp.: 351

4,443,938, Re. S.N. 755, 370, Filed July 15, 1985, Cl. 30/047, DISPOSABLE RAZOR WITH SLIDING CAP, Peter Bowman, et al., Owner of Record: *Warner-Lambert Co., Morris Plains, N.J.,* Attorney or Agent: Robert H. Bachman, et al., Ex. Gp.: 324

4,451,142, Re. S.N. 755,787, Filed July 17, 1985, Cl. 355/055, METHOD OF AND APPARATUS FOR DETECTING INITIAL POSITION OF EASEL AND LENS IN PHOTOGRAPHIC APPARATUS, Yuji Takenaka, et al., Owner of Record: *Fuji Photo Film Co., Ltd., Kanagawa, Japan,* Attorney or Agent: Robert B. Murray, et al., Ex. Gp.: 211

4,462,888, Re. S.N. 757,267, Filed July 22, 1985, Cl. 204/286, ELECTRODE FOR FUSED MELT ELECTROLYSIS, Konrad Koziol, et al., Owner of Record: *C. Conradty Nurnberg GmbH & Co., KG., Penitz, Germany,* Attorney or Agent: John B. Young, et al., Ex. Gp.: 112

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,697,188, Reexam. No. 90/000,829, Requested: Aug. 5, 1985, Cl. 408/1, APPARATUS FOR FORMING HOLES IN AND INSTALLING LINES IN STRUCTURAL MEMBERS, George F. Pope, Owner of Record: *Scoggins Manufacturing, Inc., Graham, N.C.,* Attorney or Agent: Matthews, Woodbridge, et al., Ex. Gp.: 320, Requester: Owner

4,302,440, Reexam. No. 90/000,831, Requested: Aug. 8, 1985, Cl. 424/25, EASILY-SWALLOWED POWDER-FREE AND GASTRIC-DISINTEGRABLE ASPIRIN TABLET THINLY-COATED WITH HYDROXYPROPYL METHYLCELLULOSE AND AQUEOUS SPRAY-COATING PREPARATION THEREOF, Phillip M. John, et al., Owner of Record: *Sterling Drug, Inc., New York, N.Y.,* Attorney or Agent: B. Woodrow Wyatt, Ex. Gp.: 120, Requester: Owner

4,330,296, Reexam. No. 90/000,835, Requested: Aug. 13, 1985, Cl. 23/230, ALBUMIN REAGENT AND ASSAY, Chandra P. Jain, et al., Owner of Record: *Beckman Instruments, Inc., Fullerton, Calif.,* Attorney or Agent: Robert S. Frieman, Ex. Gp.: 130, Requester: Epstein & Edell, Arlington, Va.

4,356,732, Reexam. No. 90/000,834, Requested: Aug. 12, 1985, Cl. 73/862.33, TORQUE AND TORSION ANGLE MEASURING APPARATUS, Hansjorg Hachtel, et al., Owner of Record: *Robert Bosch GmbH, Stuttgart, Germany,* Attorney or Agent: Frishauf, Holtz, et al., Ex. Gp.: 268, Requester: Owner

4,475,242, Reexam. No. 90/000,833, Requested: Aug. 9, 1985, Cl. 455/32, MICROWAVE COMMUNICATIONS SYSTEM, Marc Rafal, et al., Owner of Record: *Avnet, Inc., Ellenville, N.Y.,* Attorney or Agent: Darby & Darby, Ex. Gp.: 260, Requester: Owner

Errata

The following registration numbers were inadvertently listed as canceled in the "Trademark Registrations Canceled, Section 8" section of the following Trademark Official Gazettes:

1,007,872	TM 613	Aug. 25, 1981
1,041,160	TM 307	Nov. 9, 1982
1,066,989	TM 501	Oct. 25, 1983
1,072,298	TM 515	May 15, 1984
1,079,163	TM 342	May 8, 1984
1,080,973	TM 846	May 29, 1984
1,098,998	TM 230	Apr. 2, 1985
1,104,124	TM 220	June 11, 1985
1,111,084	TM 223	June 11, 1985

Consequently, the above-identified registrations are still active.

PATRICIA M. DAVIS,
Aug. 1, 1985. *Administrator for Trademark Operations.*

Errata

The following registration numbers were inadvertently listed as renewed in the "Trademark Registrations Renewed" section of the following Trademark Official Gazettes:

768,346	TM 833	July 31, 1984
770,077	TM 375	Sept. 11, 1984
775,618	TM 225	Apr. 2, 1985
785,055	TM 677	Apr. 16, 1985

Consequently, the above-identified registrations are cancelled.

PATRICIA M. DAVIS,
Aug. 1, 1985. *Administrator for Trademark Operations.*

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Apr. 28, 1981, was listed inadvertently:

1,152,067	TM 570	Apr. 28, 1981

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

PATRICIA M. DAVIS,
Aug. 8, 1985. *Administrator for Trademark Operations.*

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Apr. 2, 1985, was inadvertently issued:

1,328,696	TM 208	Apr. 2, 1985

Consequently, the above-identified registration number has been vacated.

PATRICIA M. DAVIS,
Aug. 1, 1985. *Administrator for Trademark Operations.*

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Apr. 16, 1985, was inadvertently issued:

1,330,938	TM 654	Apr. 16, 1985

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

PATRICIA M. DAVIS,
July 29, 1985. *Administrator for Trademark Operations.*

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of July 9, 1985, was inadvertently issued:

1,347,710	TM 195	July 9, 1985

Consequently, the certificate of registration bearing the above-identified registraiton number has been destroyed and the registration number has been vacated.

PATRICIA M. DAVIS,
July 25, 1985. *Administrator for Trademark Operations.*

U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing National Technical Information Service U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-076,706 (4,513,528). ROPE WICK APPLICATOR.
SN 6-497,657 (4,515,780). ANIMAL NUTRITION.
SN 6-742,485. METHOD FOR PREDICTING THE ACCEPTABILITY OF COARSELY GROUND BEEF.

DEPARTMENT OF COMMERCE

SN 6-300,830 (4,445,389). LONG WAVELENGTH ACOUSTIC FLOWMETER.
SN 6-571,288 (4,520,320). SYNCHRONOUS PHASE MARKER AND AMPLITUDE DETECTOR.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-708,517. BLOOD LYSIS AND CULTURE SYSTEM.

DEPARTMENT OF THE AIR FORCE

SN 6-329,558 (4,513,429). SAMPLE DATA PHASE LOCKED LOOP FOR ADAPTIVE DOPPLER TRACKER.
SN 6-343,032 (4,518,759). SYNTHESIS OF ARYLENE SILOXANYLENE POLYMERS AND COPOLYMERS.
SN 6-347,391 (4,516,858). MULTIPLE SITE LASER EXCITED POLLUTION MONITORING SYSTEM.
SN 6-347,749 (4,517,568). ANGLE SET-ON APPARATUS.
SN 6-361,016 (4,510,525). STEREOSCOPIC VIDEO IMAGERY GENERATION.
SN 6-388,327 (4,510,622). HIGH SENSITIVITY MILLIMETER-WAVE MEASUREMENT APPARATUS.
SN 6-388,574 (4,511,219). KALMAN FILTER PREPROCESSOR.
SN 6-403,246 (4,520,504). INFRARED SYSTEM WITH COMPUTERIZED IMAGE DISPLAY.
SN 6-403,247 (4,511,228). MEASUREMENT OF VISUAL CONTRAST SENSITIVITY.
SN 6-431,434 (4,517,517). NICKEL-CADMIUM BATTERY CONDITIONER AND TESTER APPARATUS.
SN 6-431,866 (4,517,464). SENSOR SYSTEM.
SN 6-439,439 (4,514,056). ACOUSTICALLY TUNED OPTICAL FILTER SYSTEM.
SN 6-442,496 (4,514,758). FALL VELOCITY INDICATOR/VIEWER.
SN 6-452,601 (4,511,220). LASER TARGET SPECKLE ELIMINATOR.
SN 6-471,550 (4,517,570). METHOD FOR TUNING A PHASED ARRAY ANTENNA.
SN 6-478,589 (4,508,662). PENTAFLUOROTELLURIUMOXIDE FLUOROCARBONS.
SN 6-486,477 (4,519,055). OPTICAL DISC TRANSPORT SYSTEM.
SN 6-486,603 (4,520,364). ATTACHMENT METHOD-CERAMIC RADOME TO METAL BODY.
SN 6-529,412 (4,517,618). PROTECTION CIRCUITRY FOR HIGH VOLTAGE DRIVERS.
SN 6-566,352 (4,515,001). VARIABLE RADIUS LEAD FORMER.
SN 6-577,391 (4,510,377). SMALL CARTRIDGE HEATER.
SN 6-643,140 (4,515,847). EROSION-RESISTANT NOSETIP CONSTRUCTION.
SN 6-741,644. ARITHMETIC PIPELINE FOR IMAGE PROCESSING.
SN 6-743,853. HARMONIC DISTORTION REDUCTION TECHNIQUE FOR DATA ACQUISTION.
SN 6-744,593. LIQUID CRYSTAL NON-DESTRUCTIVE INSPECTION OF METALS.

DEPARTMENT OF THE ARMY

SN 6-455,362 (4,508,929). RECOVERY OF ALCOHOL FROM A FERMENTATION SOURCE BY SEPARATION RATHER THAN DISTILLATION.
SN 6-730,125. PHOTOSENSITIVE CARTRIDGE FOR WEAPONS ZEROING AND MARKSMANSHIP TRAINING.
SN 6-732,335. FORWARD FIELD AUTOTRANSFUSION DEVICE.
SN 6-740,610. SUTURE NEEDLE HOLDER.

Removal from Register

Pursuant to the provisions of 37 CFR 10.11(b), a letter was directed on June 10, 1985 to Mr. Richard M. Jen-

nings, Esq. at Madsen & Jennings, Suite 108, 17731 Irvine Blvd., Tustin, Calif. 92680, the last post office address furnished by him to the Office of Enrollment and Discipline. No reply was received within the period of thirty days therein set. Accordingly, his name has been removed from the Register of Attorneys and Agents effective July 23, 1985.

CAMERON WEIFFENBACH,
Aug. 18, 1985. *Director, Office of Enrollment & Discipline.*

Patents Available for License or Sale

The following patents are offered for sale on reasonable terms by Nordson Corp. Inquiries should be addressed to Michael L. Gill, Patent Counsel, Nordson Corp., 555 Jackson St., Amherst, Ohio 44001.

4,283,764. MANUALLY PROGRAMMABLE ROBOT WITH POWER-ASSISTED MOTION DURING PROGRAMMING.
4,305,028. SYSTEM FOR EVALUATING THE CAPABILITY OF WORK-PERFORMING ROBOT.
4,360,886. METHOD AND APPARATUS FOR ANALYZING THE FEASIBILITY OF PERFORMING A PROGRAMMED SEQUENCE OF MOTIONS.
4,367,532. MANUALLY PROGRAMMABLE ROBOT WITH POWER-ASSISTED MOTION.
4,372,721. APPARATUS FOR CALIBRATING LINK POSITION TRANSDUCERS OF A TEACHING ROBOT AND A WORK ROBOT.
4,459,898. STREAMLINED MULTI-AXIS ROBOT WRIST ASSEMBLY.
4,481,591. METHOD AND APPARATUS FOR MODIFYING A PRERECORDED SEQUENCE OF ON/OFF COMMANDS.
4,484,120. AUXILIARY FUNCTION COMMAND PRESEQUENCING FOR A ROBOT CONTROLLER.
4,484,294. METHOD AND APPARATUS FOR MODIFICATION OF A PRERECORDED PROGRAMMED SEQUENCE OF MOTIONS.
4,486,843. TRANSITIONAL COMMAND POSITION MODIFICATION FOR A CONTROLLER.
D-277,856. COMPUTERIZED ELECTRONIC ROBOT CONTROLLER.
D-278,808. PENDANT CONTROL UNIT.

General Electric Co. is prepared to grant nonexclusive licenses under the following patent upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Co., 1 River Rd., Bldg. 500, Rm. 218, Schenectady, N.Y. 12345.

4,447,466. PLASMA SPRAY-CAST COMPONENTS.

3,862,876. PROTECTIVE EDGE WEIGHTED COVER CLOTH. *L. Graves,* 5927 S. Grant, Littleton, Colo. 80121.
4,159,103. SLEEVE ACTUATED VALVE. *James A. Oliff,* Esq., Parkhurst& Oliff, 277 S. Washington St., Suite 212, Alexandria, Va. 22314, 703-836-6400.
4,477,414. EVAPORATIVE CONTAINER. *Browdy and Neimark,* 419 Seventh St., N.W., Washington, D.C. 20004 (202) 628-5197.
4,528,554. SIGNAL LIGHT FOR FISHING RODS AND TIP UPS. *Robert James Klefbeck,* 3 Dresden Ct., Albany, N.Y. 12203.
3,913,632. VEHICLE TIRE INFLATING SYSTEM. *Walter H. Dudar,* Tel-Air Corp., 2440 Bonnywood, Dallas, Tex. 75233.
4,212,334. TIRE INFLATING UNIT. *Walter H. Dudar,* Tel-Air Corp., 2440 Bonnywood, Dallas, Tex. 75233.
4,239,184. VALVE STEM. *Walter H. Dudar,* Tel-Air Corp., 2440 Bonnywood, Dallas, Tex. 74233.
4,528,767. FISHING LINE AGITATOR. *Willard G. Smith, Jr.,* 71 Cemetery Rd., R.F.D. #1, East Harwich, Mass. 02645.
D-271,400. VIOLIN. *Chester Knighten,* Box 62, Foreman, Ark. 71836.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 10, 1985

Re. 31,850	4,481,170	4,500,856	4,511,562
3,862,019	4,481,523	4,501,814	4,511,753
4,152,779	4,483,345	4,502,850	4,511,788
4,245,929	4,483,698	4,502,900	4,512,420
4,254,689	4,484,027	4,503,148	4,512,473
4,354,975	4,484,077	4,503,438	4,512,633
4,370,324	4,484,214	4,504,547	4,512,797
4,386,876	4,484,614	4,504,743	4,513,033
4,391,935	4,485,220	4,505,691	4,513,252
4,396,258	4,485,834	4,505,870	4,513,445
4,411,152	4,486,391	4,506,164	4,514,594
4,416,667	4,487,602	4,506,963	4,514,628
4,421,428	4,488,096	4,507,169	4,515,091
4,421,553	4,489,216	4,507,466	4,515,515
4,432,981	4,489,711	4,507,555	4,515,582
4,435,526	4,490,363	4,507,900	4,516,156
4,436,398	4,490,711	4,508,482	4,516,655
4,442,206	4,490,752	4,508,630	4,517,016
4,445,229	4,490,831	4,508,712	4,517,039
4,454,066	4,490,846	4,508,736	4,517,610
4,454,114	4,492,485	4,509,047	4,517,753
4,455,354	4,492,627	4,509,093	4,517,838
4,458,989	4,495,410	4,509,151	4,518,043
4,465,569	4,495,599	4,509,196	4,518,047
4,467,440	4,495,609	4,509,208	4,518,417
4,473,017	4,496,850	4,509,249	4,518,479
4,474,148	4,497,426	4,509,319	4,518,551
4,474,191	4,497,650	4,509,672	4,518,653
4,475,096	4,498,538	4,510,012	4,518,713
4,477,500	4,498,848	4,510,310	4,519,143
4,478,121	4,499,135	4,510,533	4,520,026
4,478,702	4,499,233	4,510,544	4,520,226
4,478,717	4,499,850	4,510,628	4,521,314
4,478,749	4,500,332	4,511,464	4,522,569
4,478,859	4,500,717	4,511,496	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 3, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	12-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	11-30-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-11-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-17-82
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	11-29-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-19-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-23-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-15-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during July 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,395,406 to 3,399,405, inclusive

Plant Patents . . . . . Numbers 2,825 to 2,829 inclusive

REEXAMINATIONS

SEPTEMBER 10, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,910,349 (382nd)
APPARATUS AND METHOD FOR CEMENTING WELL LINERS

Joe R. Brown; Chudleigh B. Cochran, and James W. Montgomery, all of Houston, Tex., assignors to Hughes Tool Oil Co.

Reexamination Request Nos. 90/000,497, Feb. 6, 1984 and 90/000,647, Oct. 12, 1984.
Reexamination Certificate for Patent No. 3,910,349, issued Oct. 7, 1975, Ser. No. 521,346, Nov. 6, 1974.
Int. Cl.[3] **E21B** *33/14, 43/10*
U.S. Cl. 166—153

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **4–7**, **9**, **10**, **12** and **13** are cancelled.

Claims **2**, **3**, **8**, **11** and **14** are determined to be patentable as amended.

Claims **15–19**, dependent on an amended claim, are determined to be patentable.

2. [Apparatus as set forth in claim **1** in which] *Apparatus for cementing a liner in a well bore, comprising:*

a setting tool having a tubular mandrel connected in a pipe string for extension through said liner;

seal means releasably attached to said liner and sealingly engaging the exterior of said mandrel and the interior of said liner permitting at least limited axial movement of said mandrel without movement of said seal means;

latch means included with said seal means engagable with corresponding groove means within said liner to releasably hold said seal means against axial displacement therein; and

said mandrel comprising a first portion and an axially spaced second portion of less diameter than said first portion, said first portion when in registration with said latch means preventing disengagement of said latch means from said groove means, said second portion when in registration with said latch means allowing disengagement of said latch means from said groove means, said sealing engagement between said seal means and said first mandrel portion being interruptable upon axial displacement of said mandrel to a position in which said seal means surrounds said second mandrel portion.

B1 3,948,636 (381st)
FLOWABLE AQUEOUS COMPOSITION OF WATER-INSOLUBLE PESTICIDE

Alfred F. Marks, Mentor, Ohio, assignor to SDS Biotech Corp., Del.

Reexamination Request No. 90/000,515, Mar. 2, 1984.
Reexamination Certificate for Patent No. 3,948,636, issued Apr. 6, 1976, Ser. No. 305,064, Nov. 9, 1972.
Int. Cl.[3] **A01N** *25/22*
U.S. Cl. 71—112

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **4** are determined to be patentable as amended.

Claims **2**, **3** and **5–15**, dependent on an amended claim, are determined to be patentable.

1. A flowable, storage-stable, aqueous pesticide concentrate readily dilutable in water to provide an effective amount of pesticide for spray application which, prior to dilution, consists essentially of, by weight of the total concentrate,

a. from 10 to 60% of an essentially water-insoluble pesticide component having an average particle size ranging between about 1 and 10 microns;

b. from 1 to 10% of at least one nonionic surfactant; and

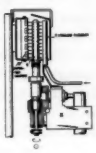
c. from 0.02 to 1.0% of a [heteropolysaccharide] *xanthan* gum,

the balance being water.

B1 4,076,071 (383rd)
METHOD FOR HEATING PLASTICS MATERIALS

Otto Rosenkranz, Hamburg; Heinz Goos, Schenefeld, and Karl-Heinrich Seifert, Hamburg, all of Fed. Rep. of Germany, assignors to Fried Krupp Gesellschaft mit Beschrankter Haftung, Essen, Fed. Rep. of Germany

Reexamination Request No. 90/000,576, Jun. 18, 1984.
Reexamination Certificate for Patent No. 4,076,071, issued Feb. 28, 1978, Ser. No. 516,904, Oct. 22, 1974.
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1973, 2352926
Int. Cl.[3] **F25B** *13/00;* **B28B** *11/08*
U.S. Cl. 165—2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

1. A method of heating an essentially tubular thermoplastic parison, comprising the steps of placing the parison at a first temperature in a thermal conditioning zone in simultaneous

heat exchange relation to both an elongated array of infra-red heating elements and a source of a gaseous coolant, displacing the parison transversely along the array of heating elements (a) while simultaneously subjecting the parison to both heat from the infra-red heating elements and a stream of gaseous coolant issuing from said source, and (b) while rotating the parison about its longitudinal axis so that the exterior surface of said parison is both heated and cooled to avoid localized overheating and consequent heat degradation of the parison surface, and then displacing the parison from the thermal conditioning zone at a second temperature greater than the first temperature, wherein the parison at the second temperature is deformable and workable.

B1 4,127,598 (384th)

PROCESS FOR REMOVING BIPHENYLS FROM CHLOROSILANES

Harry R. McEntee, Waterford, N.Y., assignor to General Electric Co., N.Y.

Reexamination Request No. 90/000,667, Nov. 9, 1984.
Reexamination Certificate for Patent No. 4,127,598, issued Nov. 28, 1978, Ser. No. 828,367, Aug. 29, 1977.
Continuation-in-part of Ser. No. 770,329, Feb. 22, 1977, abandoned.
Int. Cl.[3] **C07F** *7/20*
U.S. Cl. 556—442

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–20** is confirmed.

New claims **21–28** are added and determined to be patentable.

1. A process for removing biphenyls from impure silanes and siloxanes comprising (1) passing a first stream of impure silanes and siloxanes containing biphenyls into contact with an adsorbent bed selected from the class consisting of molecular sieves and charcoal and (2) adsorbing the biphenyls from said first stream of silanes and siloxanes on said adsorbent bed, and (3) removing a second stream of purified silanes and siloxanes from said adsorbent bed containing a smaller amount of biphenyls than said first stream.

B1 4,128,602 (385th)

POLYPHENYLENE ETHER COMPOSITIONS CONTAINING RUBBER MODIFIED POLYSTYRENE

Arthur Katchman, Delmar, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

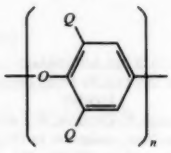
Reexamination Request No. 90/000,484, Dec. 15, 1983.
Reexamination Certificate for Patent No. 4,128,602, issued Dec. 5, 1978, Ser. No. 809,440, Jun. 23, 1977.
Continuation of Ser. No. 489,510, Jul. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 122,079, Mar. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 31,793, Apr. 24, 1970, abandoned.
Int. Cl.[3] **C08L** *51/04, 25/04, 71/04*
U.S. Cl. 525—68

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–19** are cancelled.

New claims **20–57** are added and determined to be patentable.

20. A high impact thermoplastic composition comprising from 1 to 99% by weight of a polyphenylene ether having the repeating structural formula:



wherein the oxygen ether atom of one unit is connected to the benzene nucleus of the next adjoining unit, n is a positive integer and is at least 50, and each Q is a monovalent substituent selected from the group consisting of hydrogen, halogen, hydrocarbon radicals free of a tertiary alpha-carbon atom, halohydrocarbon radicals having at least two carbon atoms between the halogen atom and the phenyl nucleus, hydrocarbonoxy radicals and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atom and the phenyl nucleus, from 99 to 1% of a polystyrene resin, on a rubber-free basis, and from 0.1 to 30% by weight of the total weight of the composition of a rubber, said composition having a dispersed particulate rubber phase in which the particles have a maximum mean diameter of about 2 microns wherein the maximum mean diameter is determined by optical contrast microscopy.

B1 4,243,681 (386th)

ALKYLTHIOPHENOXYPROPANOLAMINES AND PHARMACEUTICAL COMPOSITIONS AND USES THEREOF

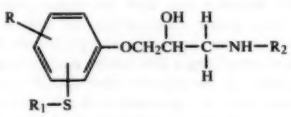
Duane F. Morrow, and William L. Matier, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Reexamination Request No. 90/000,381, May 11, 1983.
Reexamination Certificate for Patent No. 4,243,681, issued Jan. 6, 1981, Ser. No. 30,497, Apr. 16, 1979.
Continuation-in-part of Ser. No. 942,222, Sep. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 841,168, Oct. 11, 1977, abandoned.
Int. Cl.[3] **A61K** *31/135;* **C07C** *83/00, 91/00, 93/06*
U.S. Cl. 514—653

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–15** is confirmed.

1. A compound of the formula



or an acid addition salt thereof wherein

R is hydrogen or methyl;

R_1 is alkyl of 1 to 4 carbon atoms inclusive;

R_2 is straight chain alkyl of 6 to 2 carbon atoms inclusive, or cyclohexylalkyl having 2 to 4 carbon atoms in the alkylene chain.

B1 4,354,492 (387th)

MEDICAL ADMINISTRATION SET WITH BACKFLOW CHECK VALVE

Charles J. McPhee, Huntington Beach, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Reexamination Request No. 90/000,532, Mar. 20, 1984.
Reexamination Certificate for Patent No. 4,354,492, issued Oct. 19, 1982, Ser. No. 215,949, Dec. 12, 1980.
Continuation of Ser. No. 30,398, Apr. 16, 1979, abandoned.
Int. Cl.[3] **A61M** *5/00*
U.S. Cl. 604—247

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4–6** and **8** is confirmed.

Claims **1–3**, **7**, and **9–14** are cancelled.

New claim **15** is added and determined to be patentable.

[1. A medical administration set with a check valve, wherein the improvement comprises: a valve housing having a valve seat; a compliant sheet-like valve member being free of mechanical bias against the valve seat and movably confined in a compartment of the housing without a physical anchoring to the housing, and a plurality of spaced supports connected to the housing which maintain a sealing surface of the valve member at a distance of 0.002 to 0.030 inch from the valve seat when the valve is open; said valve member having sufficient width to cause a pressure differential in either direction across the valve member as low as 2 inches of water to alternately open and close the valve by means of gravity liquid draining at liquid flow rates commonly used in medical administration sets.**]**

B1 4,451,645 (388th)

EPOXY COMPOUNDS

Peter Johncock, Farnborough, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Reexamination Request No. 90/000,705, Jan. 4, 1985.
Reexamination Certificate for Patent No. 4,451,645, issued May 29, 1984, Ser. No. 423,318, Sep. 24, 1982.
Claims priority, application United Kingdom, Oct. 1, 1981, 8129618
Int. Cl.[3] **C08G** *59/28, 59/30, 59/32*
U.S. Cl. 528—391

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

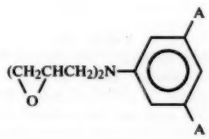
Claims **1–4**, **8**, **10**, **11** and **16–18** are cancelled.

Claims **5–7**, **9**, **12–15** and **20–22** are determined to be patentable as amended.

Claim **19**, dependent on an amended claim, is determined to be patentable.

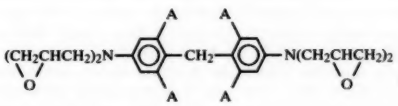
New claims **23–27** are added and determined to be patentable.

7. An epoxy compound **[**as claimed in claim **1** wherein the epoxy compound includes one aromatic ring and two polyfluoroalkyl groups, the epoxy compound**]** having the general formula:



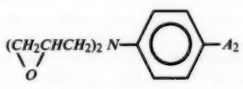
[is**]** *in* which *each* A is a *group independently selected from hydrogen and* A_1, *where* A_1 *represents a* polyfluoroalkyl group $X(CF_2)_n$, *where X is H or F and n is an integer in the range of 1 and 10, provided that at least one group A is* A_1.

15. An epoxy compound **[**as claimed in claim **1** wherein the epoxy compound includes two aromatic rings and two halogen or polyfluoroalkyl groups per aromatic ring, the epoxy compound**]** having the general formula:



in which *each* A is a *group independently selected from hydrogen,* halogen **[**or**]** *and* A_1, *where* A_1 *represents a* polyfluoroalkyl group $X(CF_2)_n$, *where X is H or F and n is an integer in the range of 1 and 10, provided that at least one group A attached to each aromatic ring is halogen or* A_1.

23. An epoxy compound having a formula:



wherein A_2 *represents a polyfluoroalkoxy group* $X(CF_2)_nCH_2O$, *where X is H or F and n is an integer in the range from 1 to 10.*

REISSUES

SEPTEMBER 10, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

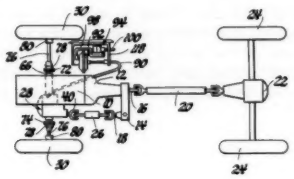
Re. 31,981
CONTROL SYSTEM FOR SPLIT AXLE DRIVE MECHANISM

Brook A. Lindbert, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Original No. 4,407,387, dated Oct. 4, 1983, Ser. No. 268,580, May 29, 1981. Application for reissue Apr. 16, 1984, Ser. No. 600,981

Int. Cl.[3] **B60K** *17/34, 23/08*

U.S. Cl. 180—247 **13 Claims**



9. A control system for automatically operating the clutch in a single clutch split axle drive mechanism responsive to an operational mode of a transfer case, with which the split axle drive mechanism is used in a part-time four-wheel drive vehicle powered by an internal combustion engine comprising:

a motor operatively connected to the clutch so that the clutch is biased toward disengagement when a first signal is communicated to the motor and biased toward engagement when a second signal is communicated to the motor,

control means having a first operative position where the first signal is communicated to the motor and a second operative position where the second signal is communicated to the motor,

means positioning the control means in the second operative position when the transfer case is in a four-wheel drive mode whereby the clutch is automatically engaged when four-wheel drive is selected, and

time delay means for delaying clutch engagement to a time after the transfer case is shifted to four-wheel drive, so that the clutch parts are rotating in the same direction and four-wheel drive can be selected while the vehicle is in motion.

Re. 31,982
DEHYDRATED POTATO PROCESSES

Roderick G. Beck; Lyle H. Parks; Mounir A. Shatila, all of Blackfoot, Id., and Arden O. Pulley, St. Louis, Mo., assignors to Basic American Foods, San Francisco, Calif.

Original No. 3,991,222, dated Nov. 9, 1976, Ser. No. 538,292, Jan. 2, 1975. Continuation of Ser. No. 192,590, Oct. 26, 1971, abandoned, which is a division of Ser. No. 39,141, May 20, 1970, Pat. No. 3,634,105, which is a continuation of Ser. No. 655,746, Jul. 25, 1967, abandoned. Application for reissue Aug. 12, 1977, Ser. No. 823,983

Int. Cl.[3] **A23L** *1/216*

U.S. Cl. 426—550 **11 Claims**

1. A process for producing permanently agglomerated reconstituted cooked potato strips or pieces suitable for use without loss of piece identity in the preparation of such potato dishes as pan fired or hash browns as a substitute for like strips or pieces of natural potato, comprising the steps of: (a) cooking fresh potatoes and producing therefrom a mash of separated potato cells; (b) incorporating uniformly into said mash sufficient ungelatinized raw starch to form a dough composed of a maximum of 20 percent by weight of said starch and a minimum of 80 percent by weight of said separated potato cells; (c) heating said dough at a temperature of about 190° F. to gelatinize said raw starch and provide a binding gel structure formed of said gelatinized starch and said separated potato cells; (d) forming said heated dough into pieces of strips about $\frac{1}{8}$–$\frac{1}{4}$ inch in thickness; (e) predrying said piece or strips to about 65 percent moisture content out of contact with one another to remove the surface moisture so as to prevent them from adhering to one another; (f) drying said formed pieces or strips to a moisture content of about $7\frac{1}{2}$ percent; and (g) reconstituting said pieces of strips with water to absorb about 1.5–2.0 times their dry weight resulting in permanently agglomerated pieces or strips suitable for use without loss of piece identity as a substitute for natural potatoes in the preparation of such potato dishes as pan fried or hash browns.

Re. 31,983
DEHYDRATED POTATO PROCESSES AND PRODUCTS

Roderick G. Beck; Lyle H. Parks; Mounir A. Shatila, all of Blackfoot, Id., and Arden O. Pulley, St. Louis, Mo., assignors to Basic American Foods, San Francisco, Calif.

Original No. 3,634,105, dated Jan. 11, 1972, Ser. No. 39,141, May 20, 1970. Continuation of Ser. No. 655,746, Jul. 25, 1967, abandoned. Application for reissue Jul. 17, 1978, Ser. No. 925,650

Int. Cl.[3] **A23L** *1/216*

U.S. Cl. 426—550 **7 Claims**

1. A process for producing a reconstituted dehydrated cooked potato strip or piece suitable for use, without loss of piece identity, in the preparation of dishes as a substitute for a like strip or piece of natural cooked potato comprising the steps of:

a. producing an aqueous dough with a solids content on the order of 25 percent, said solids comprising not less than 80 percent undamaged separated previously dehydrated cooked potato cells and a maximum of 20 percent ungelatinized raw starch added in an amount sufficient after subsequent gelatinization to give the required adhesive character to the dough to impart to the eventual dehydrated strip or piece a texture to allow reconstitution and pan frying without loss of piece identity;

b. subjecting said dough to a temperature sufficient to gelatinize the ungelatinized starch without drying;

c. forming said heat-treated dough while still hot into pieces or strips about one-eighth to one-fourth inch in thickness, suitable for eventual dish preparation;

d. predrying said pieces or strips out of contact with one another to remove the surface moisture to prevent them from adhering to one another;

e. finally drying said pieces or strips immediately following the predrying to prevent diffusion of moisture to their surface to a moisture content on the order of $7\frac{1}{2}$ percent; and

f. reconstituting said pieces with water without loss of piece identity for use in dish preparation.

PLANT PATENTS

GRANTED SEPTEMBER 10, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,552
NEW ROSE PLANT—HOMBRE

Nelson F. Jolly, Galena, Md., assignor to Jolly's Rosehill Farm of Kent, Inc., Galena, Md.

Filed Dec. 22, 1983, Ser. No. 564,286
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by exceptionally heavy petaled flowers borne primarily one to a stem of good form with petals reflexing upon opening while retaining symmetrical configuration and flowers which are very long lasting on the plant and after cutting which flowers combine near white coloring of outer petals with Spanish orange flower centers where petals remain bunched.

5,553
ROSE PLANT-OLYCISO VARIETY

Huibert W. Olij, Pr De Kwakel, Netherlands, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Dec. 13, 1983, Ser. No. 560,920
Claims priority, application Netherlands, Oct. 13, 1981, R00 1081
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct vareity of Floribunda rose plant of vegetative reproduction substantially as illustrated and described by the fact that:

(a) from the physical point of view, the rose plant with light green wood has bicolor semi-double flowers which are china pink on the inside and whitish-cream suffused with china rose on the outside; and

(b) from the biological point of view, the rose plant has vigorous vegetation, produces flowers in abundance and particularly is amenable to greenhouse forcing, is not particularly susceptible to diseases, and forms long lasting flowers comprising petals which detach cleanly.

5,554
ELM TREE

Benjamin J. King, 4600 Millers Station Rd., Hampstead, Md. 21074

Filed Jul. 27, 1984, Ser. No. 635,155
Int. Cl.³ A01H *5/12*
U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of elm tree as herein described and illustrated, primarily chracterized by growth rate, dendritic pattern, vigorous propagation and leaf appearance.

5,555
WEIGELA PLANT - GEENALTAN

Hermann Geers, Jr., Boskoop, Netherlands, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Dec. 22, 1983, Ser. No. 564,165
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of Weigela, substantially as illustrated and described, characterized as to novelty by the following combination of characteristics:

(a) a vigorous dwarf growth habit wherein the plant assumes about one-third the size of *Weigela florida* Eva Rathke, and a size which is substantially smaller than that of *Weigela florida* Eva Supreme,

(b) a deep crimson flower coloration which is very close to that of *Weigela florida* Eva Rathke,

(c) a flower size which is very close to that of *Weigela florida* Eva Rathke, and

(d) flower formation in a greater abundance and for a longer duration than *Weigela florida* Eva Rathke, with said floriferousness commonly reaching its height during early to mid-June when grown at West Grove, Pa., and continuing thereafter though in moderation until frost.

5,556
HYBRID TEA ROSE CV. AROCOMU

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Dec. 5, 1983, Ser. No. 557,893
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, being particularly characterized by its unusual blended colorations of lavender-pink flowers, essentially as described and illustrated; its extremely strong and pleasing fragrance; its abundant production of well-formed flowers; and by its being a bushy plant of medium height that is attractive in the garden.

PATENTS

GRANTED SEP. 10, 1985

ERRATA

For CLASS	See PATENT NO.
623–001	4,539,716
073–454	4,539,829
514–349	4,540,578
514–195	4,540,579
514–195	4,540,580
514–415	4,540,581
514–561	4,540,582
514–656	4,540,583
290–001	4,540,888
346–076	4,541,042

PATENTS

GRANTED SEPTEMBER 10, 1985

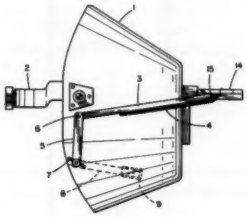
GENERAL AND MECHANICAL

4,539,713

CHIN OPERATED SHIELD AND WELDING HOOD

Raymond P. Hodge, Valparaiso, Ind., assignor to Ram Corporation, East Chicago, Ind.

Filed Jan. 30, 1984, Ser. No. 574,915
Int. Cl.³ A61F *9/06*
U.S. Cl. 2—8 **7 Claims**



1. An improved welding hood with a chain operated face shield comprising

the face shield having a viewing window;

a viewing window shield pivotably mounted on the face shield;

linkage means pivotably mounted on the face shield for pivotably moving the viewing window shield in response to chin movement; and

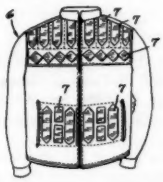
biasing means for biasing the viewing window shield closed over the viewing window, the biasing means having one end and an opposite end and being attached at the one end on the viewing window shield and at the opposite end to the linkage means.

4,539,714

HEAT CONDUCTIVE CLOTHING MATERIAL PARTICULARLY USEFUL IN THE FIELD OF THERMAL GARMENTS

Franco Fratti, Viale Certosa 46, Milano, Italy

Filed Aug. 8, 1983, Ser. No. 521,219
Claims priority, application Italy, Nov. 16, 1982, 24272 A/82
Int. Cl.³ A41D *1/02*
U.S. Cl. 2—108 **7 Claims**



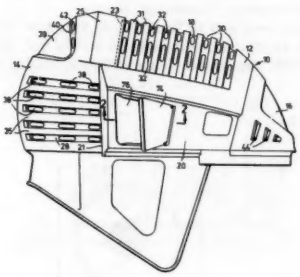
1. Heat conductive laminated clothing material particularly useful in the filed of thermal garments, said heat conductive laminated clothing material comprising a laminated structure including an outer face, adapted for exposure to the ambient athmosphere and an inner face opposite to said outer face, said laminated structure further comprising at least one solar energy collector, covering at least partially said outer face and including at least one foil element, said at least one solar energy collector further including a light absorbing surface, said light absorbing surface being defined by microdendritic structures, said microdendritic structures being adapted to absorb incedent solar radiation, said at least one solar energy collector being adapted to spread thermal energy, derived from solar radiation at said light absorbing surface through said laminated structure of said heat conductive laminated clothing material.

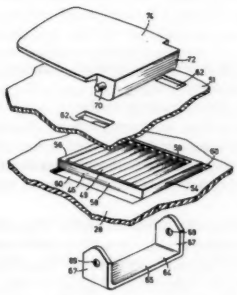
4,539,715

SIZE ADJUSTABLE HELMET

Leonard W. H. Clement, Bolton, Canada, assignor to Cooper Canada Limited, Toronto, Canada

Filed Apr. 22, 1983, Ser. No. 487,878
Int. Cl.³ A42B *3/00*
U.S. Cl. 2—420 **2 Claims**





1. A helmet comprising:

a front shell,

a rear shell movable in the forward-rearward direction with respect to the front shell,

portions of the two shells overlapping each other and presenting mating surfaces with interengageable protuberances which can engage each other to retain the shells in a given overlapping position, and can disengage to allow the shells to change their relative position,

and cam means for selectively (a) holding the mating surfaces in engagement, and (b) releasing them to disengage, the cam means including two cam members recessed into two recesses on either side of the said portion which lies outwardly of the other, each cam member being swivelable about an axis which is retrained with respect to the inwardly lying mating surface, each cam member being adapted to urge the two mating surfaces into engagement, each cam member being integral with a cam-operating lever which is accessible from the exterior of the helmet and by which the cam member can be rotated about its respective axis, each said lever being wholly recessed into the recess of its respective cam member when the latter is

urging the two mating surfaces into engagement, each said lever being swingable to a position in which it extends generally outwardly away from the helmet, in which position the cam member releases the mating surfaces.

4,539,716

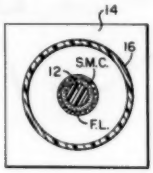
FABRICATION OF LIVING BLOOD VESSELS AND GLANDULAR TISSUES

Eugene Bell, Dedham, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 245,536, Mar. 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 972,832, Dec. 26, 1978, abandoned. This application May 8, 1981, Ser. No. 261,928

Int. Cl.[3] **A61F** *1/00;* **A61B** *19/00*

U.S. Cl. 623—1 **17 Claims**



1. A method of producing, in vitro, a living multi-layered tubular structure, comprising:

a. producing a first tubular layer by:

(1) forming a first aqueous mixture of collagen fibrils, nutrient medium and a first cellular contractile agent capable of interacting with collagen fibrils;

(2) introducing said first mixture into an annular casting chamber;

(3) maintaining the annular casting chamber containing said first mixture under conditions sufficient to allow a gel to form therein and to allow radial contraction of the gel with expression of aqueous liquid therefrom resulting from interaction of the cellular contractile agent with collagen fibrils to thereby form a contracted hydrated collagen lattice suitable as one layer of a multi-layered tubular structure; and

(4) removing aqueous liquid expressed in the formation of said first tubular layer from the annular casting chamber;

b. producing a second tubular layer outwardly of said first tubular layer by:

(1) forming a second aqueous mixture of collagen fibrils, nutrient medium and a second cellular contractile agent capable of interacting with collagen fibrils;

(2) introducing said second mixture into the annular casting chamber;

(3) maintaining the annular casting chamber containing said second mixture under conditions sufficient to allow a gel to form therein and to allow radial contraction of the gel with expression of aqueous liquid therefrom resulting from interaction of the cellular contractile agent with collagen fibrils to thereby form a contracted hydrated collagen lattice suitable as another layer of a multi-layered tubular structure; and

c. removing said multi-layered tubular structure from the annular casting chamber.

4,539,717

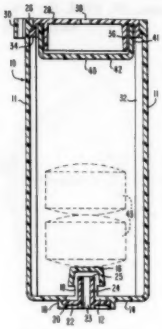
SUBMERGIBLE SELF-PRIMING DISPENSER

Joseph E. Fattori, Woodcliff Lake, N.J., assignor to Waldwick Plastics Corporation, Waldwick, N.J.

Filed Nov. 4, 1983, Ser. No. 548,843

Int. Cl.[3] **E03D** *9/02*

U.S. Cl. 4—228 **4 Claims**



1. A submergible self-priming dispenser disposed to be located within a fluid containing vessel comprising:

(a) a means for containing a fluid,

(i) said means having a top, a bottom and an opening in its bottom, said bottom opening having an inlet standpipe protruding up from the opening into the inside of the containing means, said inlet standpipe having an inlet/-dispensing opening through it and being surrounded by an inverted cup, said inverted cup having at least one cup wall that circumscribes the bottom opening and inlet standpipe, said wall having at least one opening at its base that is lower in height than the inlet standpipe; and

(ii) said means having an air vent opening on its top, said air vent opening having an air vent standpipe protruding down into the containing means;

(b) a float valve means, said means being a cup, said cup having at least one cup wall that defines a larger diameter than the air vent standpipe and a smaller diameter than the walls of the containing means, said cup being placed within the containing means so that it can float between the bottom and top of the containing means.

4,539,718

DRAINPIPE STRAINER

Richard L. Haer, 9032B McConnell, Moses Lake, Wash. 98837

Filed Mar. 23, 1984, Ser. No. 593,027

Int. Cl.[3] **E03C** *1/26, 1/264*

U.S. Cl. 4—292 **9 Claims**

1. A pipe straining device for attachment to a drainpipe having a bored circular hole formed therein, said device comprising:

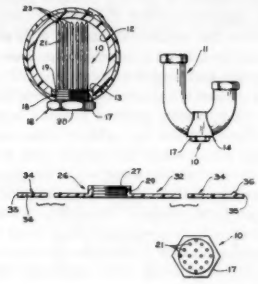
a ring member having a plug receiving central bore and a circular peripheral wall extending about the central bore and shaped to fit securely within the bored circular hole formed in the drainpipe;

a plug member having a headed end and a shank extending along an axis, releasably received through the central bore of the ring member;

a plurality of bristles spaced apart in relation to one another and extending from the shank to ends spaced axially therefrom; and

means on the ring member for securing the ring member to the drainpipe with the peripheral wall securely engaged within the radial hole, comprised of a flexible strap of

sufficient length to wrap around the drainpipe, and having means for securing the strap securely about the drainpipe,



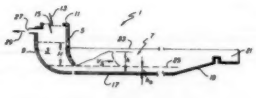
with the plug member extending into the bored hole and with its peripheral wall sealed against the bored hole wall.

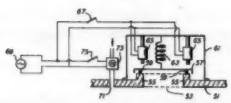
4,539,719

PNEUMATIC SURF WAVE PRODUCTION FOR POOLS

Siegfried Schuster, and Christian Boes, both of Berlin, Fed. Rep. of Germany, assignors to Automated Swimpools, Inc., Mansfield, Ohio

Filed Feb. 8, 1984, Ser. No. 578,066
Int. Cl.[3] A47K *3/10*
U.S. Cl. 4—491 **10 Claims**





1. Apparatus for producing a surfing wave above the undisturbed level of water in a pool having a floor, said apparatus comprising:

a reservoir having an interior volume disposed partially above and partially below the level of undisturbed water in a pool, generally opposed front and rear walls, and generally opposed side walls to form with said front and rear walls a first horizontal cross sectional area, each said wall terminating in a lower extremity to establish communication between said reservoir and said pool below said level of undisturbed water in said pool, said reservoir including a first aperture for admitting air, said first aperture having a second cross sectional area at least one third that of said first horizontal cross sectional area;

suction means in communication with said reservoir for evacuating air from said reservoir; and

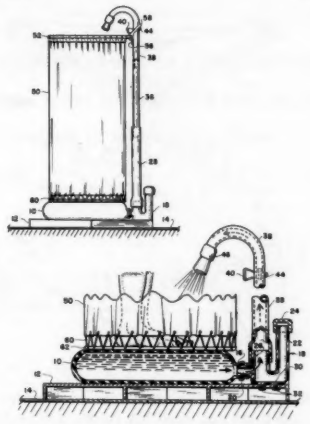
valve means for selectively sealing said reservoir against the intrusion of air and rapidly opening said first aperture to ventilate said reservoir to the atmosphere.

4,539,720

PORTABLE PERSONAL STALL SHOWER

Constance D. Westerweller, 1800 Panda Way, Hayward, Calif. 94541

Filed Aug. 4, 1983, Ser. No. 520,308
Int. Cl.[3] A47K *3/23*
U.S. Cl. 4—599 **10 Claims**



1. A portable personal bathing shower comprising:

a floor unit having a rigid, substantially flat top surface;

a pliable water storage bag positionable on said floor unit and having, when filled, generally parallel top and bottom surfaces, said bag having an opening in a side surface between said top and bottom surfaces;

a rigid fill tube removably attached to said floor unit, said fill tube having a first section adapted for removably connecting to said opening in said storage bag, a second section terminating at a level higher than the top surface of said storage bag, a removable watertight cap adapted to fit the end of said second section, and a third section having an end adapted to mate with the end of a vertical water conduit;

a shower head located in an elevated position above said water storage bag; and

a water conduit coupled between said shower head and the end of said third section of said rigid fill tube for conducting water from said bag through said shower head by pressure created by the weight of a person standing on the top surface of said water storage bag.

4,539,721

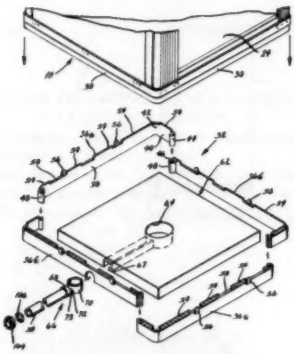
FREE-STANDING SHOWER

John W. Moore, St. Louis County, Mo., assignor to The Swan Corporation, St. Louis, Mo.

Filed Apr. 9, 1984, Ser. No. 598,500
Int. Cl.[3] A47K *3/22*
U.S. Cl. 4—613 **7 Claims**

1. A free-standing shower for permitting remote drain discharge, comprising a rectangular shower cabinet having a wall structure defining a peripheral base edge at its lower end and including a floor having a central drain, a base extension seated upon a supportive surface for supporting the base edge around the periphery thereof for elevation of the floor from the supportive surface to define a space between the floor and the supportive surface, the base extension including means for receiving and grippingly engaging the cabinet base edge, the base extension being formed of four joined members each carrying interlocking means for interlocked engagement with an adjacent one of such members, the joined members defining a four-sided rectangular configuration corresponding to the cabinet, each such member being L-shaped including an elongated portion and an integrally perpendicular short portion, a sub-base within the space so defined for supporting the floor by

evenly distributing weight to a relatively large area beneath the cabinet, the sub-base including a drain pipe assembly and fixing the location of such assembly for connection to the central drain, the sub-base constituted by a block of lightweight synthetic structural material including a central recess and a lateral recess extending radially from the central recess



to the outer periphery of said block for receiving the drain pipe assembly, the drain pipe assembly having a drain fixture positioned within the central recess and the drain pipe being positioned within the lateral recess, the drain pipe extending laterally beyond the base extension, thereby providing drain discharge at a location remote from the shower.

4,539,722

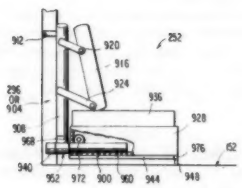
SOFA-BED-DINING TABLE COMBINATION

Alphe Broussard, 64 Ave. Mohamed Diouri, Kenitra, Morocco

Continuation-in-part of Ser. No. 403,323, Jul. 30, 1982, Pat. No. 4,488,752. This application Apr. 18, 1983, Ser. No. 485,941

Int. Cl.[3] **A47B** *85/00, 85/04;* **A47C** *17/52;* **B60P** *3/38*

U.S. Cl. 5—118 **2 Claims**



1. A sofa-bed-dining table combination device for use in a mobile home or the like, comprising in combination two back supports, which are spaced apart from each other and which are capable of being mounted on a wall or the like, two horizontal hollow cylindrical members, which are spaced apart from each other, and which are affixed to the bottom of the two vertical back supports and which are capable of being mounted on one end in a wall or the like, an elongated top slot traversing most of the length of each of the horizontal hollow cylindrical members on the end of away from the wall, a cabinet located in a horizontal position between the two horizontal hollow cylindrical members, two wheel units, which are each affixed in a horizontal position on one of the ends of the cabinet, the wheel of each wheel unit rotatably positioned in the elongated top slot of one of the horizontal cylindrical members, a short vertical mounted on the front edge of the cabinet to support it, a table top hinged on its top edge to the front edge of the cabinet, a horizontal cushion positioned on top of the horizontal cabinet, a vertical cushion hinged to the two vertical back supports, so that the vertical cushion is slightly slanted outwards the horizontal cushion is in place on top of the cabinet and the cabinet is in position against the two vertical back supports, and hinged supports pivotally affixed to the bottom of the cabinet which serve as supports for the table top when it is in an upwardly pivoted position, said hinged supports fitting flush against the cabinet when not in use, the device forming a sofa when the cabinet is in position against the wall, the device forming a bed when the device is partially positioned away from the wall, with the vertical cushion now against the two back supports, the device forming a cabinet when the device is fully positioned away from the wall, with the cabinet and top cushion rotated into a vertical position, and the device forming a dining table when the table top of the vertically-positioned cabinet is swung up into a horizontal position by means of one end of the table top being hinged to the top of the cabinet.

4,539,723

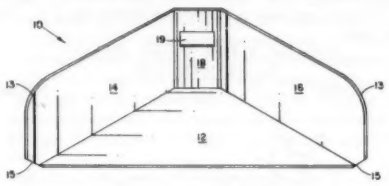
AUXILIARY MATTRESS CORNERS

Jerl D. Hillsberry, 5219 Galahad, San Antonio, Tex. 78218

Filed May 29, 1984, Ser. No. 615,107

Int. Cl.[3] **A47C** *21/02*

U.S. Cl. 5—504 **3 Claims**



1. A method for attaching and securing fitted sheets or mattress covers to liquid filled bed mattresses or conventional bed mattresses accomplished by:

a. Placement of a rigid corner forming device beneath and in abutment with each of the side walls of said mattress corners;

b. Securing the corner portions of said fitted sheets or covers respectively around said corner forming devices.

4,539,724

METHOD FOR CONTINUOUSLY TREATING STAPLE LENGTH TEXTILE FIBROUS MATERIALS

William J. Kennedy, Spartanburg, S.C., and A. John Beucus, Morganton, N.C., assignors to Beu-Tex Corp., Morganton, N.C.

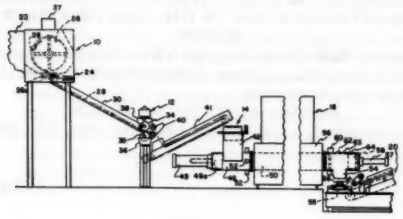
Division of Ser. No. 464,616, Feb. 7, 1983, Pat. No. 4,485,644. This application Aug. 31, 1984, Ser. No. 646,310

Int. Cl.[3] **D06B** *3/02, 23/00*

U.S. Cl. 8—149.1 **5 Claims**

1. In a method of treating staple length fibers to dye or otherwise chemically treat the same while continuously transporting the fibers in a predetermined path of travel to a point of collection, and including the steps of continuously delivering a metered amount of the fibers in generally loose random form, condensing the loose fibers into a web to increase their cohesion to each other, passing the web into and through a pair of nip rollers of a dye or chemical liquid composition applicator to impregnate the fibers with the liquid composition and express excess liquid therefrom, breaking up the web into smaller discrete fiber masses, and heating the moving liquid-

impregnated fibers in a confined zone with high frequency energy while the fibers are maintained under compression to react the dye or other chemical with the fibers before their collection; the improvement comprising the step of gravitationally delivering the fiber web to the nip rollers while continuously applying the liquid composition to the surface of the



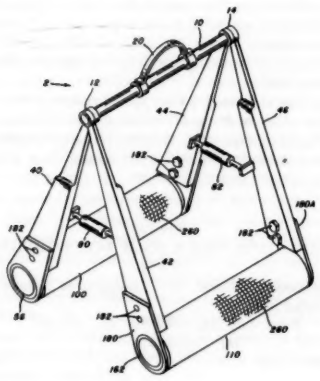
rollers to carry the composition into contact with the web of fibers passing through the nip, supportably contacting the web in its gravitational movement to the nip rollers while reducing the width of the web to further condense and accumulate the same, and passing the web continuously through an unsupported zone immediately before passage into and through the nip.

4,539,725

APPARATUS FOR CLEANING FURNACE WALLS

William R. Smith, Rockdale, Tex., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 428,421
Int. Cl.³ B22D *43/00*
U.S. Cl. 15—93 A **8 Claims**



1. Apparatus for removing deposits on walls of refractory furnaces comprising:

(a) rotating drums having self-contained air-powered rotation means therein for simultaneous engagment of opposite walls, each of said rotating drums having a first end and an opposite second end;

(b) a plurality of support arms each having a first end, a pivot point at an opposite end and an intermediate point;

(c) journal means connecting said first end of each of said support arms respectively to one of said ends of said drums;

(d) means for pivotally joining together at their pivot points two arms respectively mounted to first ends of two drums; and

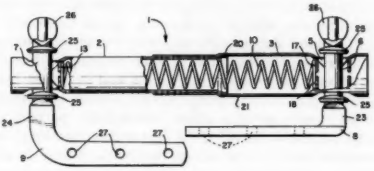
(e) spacing means positioned at the intermediate points of said pivotally joined together arms comprising an air cylinder commonly powered with said air powered rotation means to permit simultaneous rotation of said drums and urging of drums against said walls with a single control means.

4,539,726

SPRING BIASED PROP FOR A PIVOTED DOOR MEMBER

Bruce R. Bostian, Bristol, Ind., assignor to Jedco, Inc., Elkhart, Ind.

Filed May 12, 1982, Ser. No. 377,559
Int. Cl.³ E05F *1/14*
U.S. Cl. 16—72 **6 Claims**



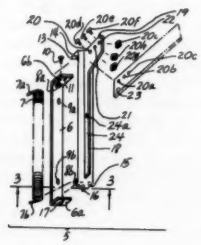
1. A spring actuated door opening and closing assist device comprising first and second tubular members positioned in telescoping relationship, each of said tubular members having a hole formed therein in a direction transverse to a centerline of the telescoping tubular members for receiving a shaft of a support means for door closure means, a coil spring located within said telescoping tubular members and extending between the respective holes in said tubular members, and wherein at least one of said holes is bounded by internally flared portions of the tubular member through which said one hole extends said flared portions providing both bearing surfaces for the shaft of the support means and an abutment for each end of said coiled spring, and wherein said holes are elongated in the direction of the centerline of the telescoping tubular members to permit relative movement between the shafts of the support means and the tubular members in the direction of the centerline of the telescoping tubular members for smooth operation of said device.

4,539,727

TOP-MOUNTED DOUBLE-ACTION DOOR HINGE

Jacob E. Mautner, 70 E. Front St., Keyport, N.J. 07735; Gerard Crennan, 1 Indian Hill Ct., and Arnold N. Anderson, 6 Wyoming Dr., both of Hazlet, N.J. 07730

Filed Jan. 19, 1984, Ser. No. 571,956
Int. Cl.³ E05F *1/14*
U.S. Cl. 16—285 **14 Claims**



1. A hinge device consisting essentially of first and second

spaced-apart hinge-support structures each mountable on an inwardly-facing surface of an upright door jamb-structure, a hinge structure having opposite hinge members mounted on the first and second hinge-support structures, a first hinge-mounting means pivotably mounting one hinge member on the first hinge-support structure, a second hinge-mounting means pivotably mounting the opposite member on the second hinge-support structure, at least one coil-spring having one spring-end thereof mounted on one end of said first and second hinge-support structures and having an opposite spring-end thereof mounted on one of said hinge member, the improvement comprising said first hinge-mounting means including one of a pivot pin and an elongated slot-forming structure and an elongated slot-space thereof, and the first hinge-support structure including the remaining one of the pin and the elongated slot-forming structure, said slot-space extending in a direction substantially transversely to a longitudinal axis of said coil spring, said pivot pin being transversely-movably mounted in said slot-space, said one of said pivot pin and said elongated slot-forming structure being mounted as a part of a first end of the hinge structure, and said remaining one of said pivot pin and said elongated slot-forming structure being mounted as a part of said first support structure, and an abutting portion of at least one of said hinge-mounting means and said first hinge-member including abutting means having spaced-apart surface portions positioned along a plane substantially parallel to a second axis extending between the first and second hinge-support structures and in juxtaposition thereto such that the abutting portion contacts and is movable-along a flat surface extending along said axis when the hinge structure is revolvably pivoted.

4,539,728

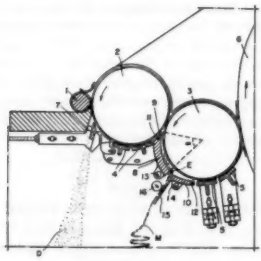
CARDS

Jose E. Portell, Roda de Ter, Barcelona Torrent 4, Spain

Filed Mar. 28, 1984, Ser. No. 594,568

Int. Cl.³ D01G *15/40*

U.S. Cl. 19—105 **2 Claims**



1. In a carding machine of the type having, in a precarding area, first and second pivotally mounted cylinders having parallel but spaced apart axes of rotation defining between them a nip, said precarding area having a first means for effecting a first removal of impurities of a generally granular nature, said first means being associated with said first cylinder, the improvement comprising, a member having two concave surfaces, each extending from a common edge, said member being disposed in said precarding area with said edge being adjacent to said nip of said cylinders, one of said concave surfaces facing said first cylinder and the other of said surfaces facing said second cylinder, said cylinders being disposed in said precarding area so that said first cylinder receives fibers to be carded before said second cylinder and so that the fibers in passing from said first cylinder to said second cylinder, pass over said edge of said member, arcuate plate means located downstream of said member and spaced therefrom on the periphery of said second cylinder to define a clearance between said member and said plate means, said member and said plate means being each pivotally mounted remote from said clearance and each having adjustment means for affecting pivoting thereof towards and away from said second cylinder and corresponding adjustment of the size of said clearance whereby a second removal of impurities through said clearance is effected.

4,539,729

APPARATUS FOR THE CONTINUOUS COMPRESSION OR DETERMINATION OF THE MASS OF A FIBER SLIVER

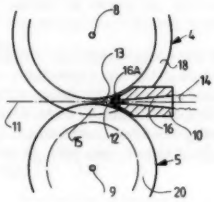
Hanspeter Meile, Winterthur, and Viktor Pietrini, Wiezikon, both of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Oct. 4, 1982, Ser. No. 432,767

Claims priority, application Switzerland, Oct. 29, 1981, 6912/81

Int. Cl.³ D01H *5/72*

U.S. Cl. 19—288 **7 Claims**



1. An apparatus for the continuous compression or determination of the mass of a fiber sliver, comprising:

a pair of coacting rollers which can be pressed towards one another;

each of said rollers having a peripheral portion;

said rollers possessing side surfaces cooperating with one another at an overlapping zone;

said peripheral portions of said rollers interengaging with one another in such a manner that there is formed a laterally bounded nip zone at the region of said cooperating side surfaces;

a feed funnel for inputting fiber sliver to the nip zone of said coacting rollers;

said feed funnel having a fiber outlet opening; and

said fiber outlet opening of said feed funnel being disposed within the region of a substantially wedge-shaped gap which is bounded by said overlapping zone of said side surfaces of the coacting rollers.

4,539,730

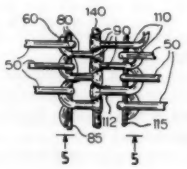
SEAMING MEANS AND A TOOL FOR FORMING THE SEAM

Eric R. Romanski, Delmar, N.Y., assignor to Albany International Corp., N.Y.

Filed Aug. 22, 1983, Ser. No. 525,563

Int. Cl.³ A44B *19/40*

U.S. Cl. 24—33 B **5 Claims**



1. A seam for joining first and second ends of a fabric used in papermaking, without a backing material, to create an endless belt comprising:

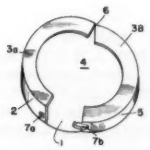
a plurality of first end loops attached to said first end;
a plurality of second end loops attached to said second end;
a first coil formed of continuous first coil loops spaced at a predetermined distance;
second coil formed of continuous second coil loops spaced at a predetermined distance; and
each said first and second coil loops engaging the respective end loops for securing the coils to the respective fabric ends;
each coil loop having a portion disposed opposite the respective end, said portion being wider than said preselected distance to interlock the loops of one of the coils to corresponding loops of the other coil in a male-female engagement when said first and second coils are intermeshed;
said first and second coils being arranged and constructed to form a space therebetween when intermeshed for an additional locking means.

4,539,731

BUTTON-COVER

Franco Torrini, Florence, Italy, assignor to Torrini G. S.p.A., Florence, Italy

Filed Apr. 28, 1983, Ser. No. 489,521
Claims priority, application Italy, May 12, 1982, 11653/82[U]; Nov. 19, 1982, 11872/82[U]
Int. Cl.³ A44B *1/16*
U.S. Cl. 24—92 **5 Claims**



1. A button cover comprising a first member having an opening for engaging the button in a substantially coaxial relation, adapted to be interposed between the button and the cuff to which it is sewn, said opening having a smaller diameter than that of the button itself; a second member designed to cover the button and articulated with respect to the first member in order to be placed in a parallel, spaced relationship with respect to the button; a perimeter spacing edge between said first and second members formed by two complementary portions respectively integral with said first and second members; an articulated connection between said first and second members for discontinuing said perimeter spacing edge, thus providing a passage for the button thread when accommodating the button therebetween; means for securing said first and second members in a closed superimposed position, said articulated connection including a hinge axis between said first and second members, and said hinge axis being disposed generally perpendicular to said button.

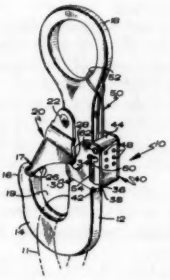
4,539,732

DOUBLE LOCKING SAFETY SNAP

James T. Wolner, Red Wing, Minn., assignor to D B Industries, Inc., Red Wing, Minn.

Filed Jan. 30, 1984, Ser. No. 575,304
Int. Cl.³ A44B *13/02*; B66C *1/36*
U.S. Cl. 24—241 R **10 Claims**

1. A double lock safety hook for reliably retaining a single lock snap system and for anchoring a belt connection, comprising:
a shank having a return portion at one end thereof to define a hook and having a nose spaced from the shank to define a hook throat;
means on the other end of said shank for attaching the load support member;
a latch member having one end pivotally mounted on said shank and the other end engageable with said hook nose to close said hook throat, said latch member is movable between a close position, wherein the belt connection is retained within said hook throat by means of said latch member engaging said hook nose, and an open position, wherein the belt connection may be released from within said hook throat;



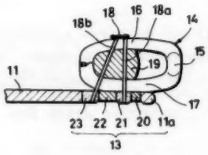
a keeper, slidably mounted on said shank whereby no physical modification of said shank is necessary, said keeper being slidably displaceable along said shank between a first position, wherein said latch member is firmly retained in its closed position engaging said hook nose, and a second position wherein said latch member is capable of moving into its open position disengaging said hook nose and opening said hook throat so that the belt connection may be removed from within said hook throat; and
means for biasing said keeper toward said first position.

4,539,733

SEPARABLE SLIDE FASTENER

Hiroshi Yoshida, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,806
Claims priority, application Japan, Sep. 30, 1982, 57-147074[U]; Oct. 23, 1982, 57-160430[U]
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—396 **4 Claims**



1. A separable slide fastener, comprising:
(a) pair of fastener stringers each including a stringer tape carrying on its inner longitudinal margin a row of continuous coupling elements, there being a core thread extending through said row of coupling elements and extending along the entire length of said stringer tape, each of said coupling elements having a coupling head and a pair of spaced legs extending from said coupling head in a common direction, said inner tape-margin having a bottom end portion devoid of coupling elements;
(b) sewing stitches securing said row of coupling elements to said inner tape-margin, with one leg of each coupling

element disposed against one face of said inner tape-margin and with the other leg disposed apart from said one face of said inner tape-margin;

(c) a separable bottom-end-stop assembly mounted on adjacent bottom ends of said stringers and including

(2) a pair of separate pin members secured to the respective stringers, each of said pin members having a longitudinal channel receiving said bottom end portion of said inner tape-margin together with a bottom end portion of said core thread, and

(2) a socket member secured to one of said pin members and having a bore for receiving a portion of the other pin member; and

(d) said bottom end portion of each said inner tape-margin having a shape along its inner edge in conformity to the shape of said channel of the respective pin member and thus having a width equal to the width of said channel of the respective pin member and smaller than the width of the remaining portion of said inner tape-margin.

4,539,734

TENSIONING DEVICE FOR THE SCREEN FABRIC IN SILK SCREEN PRINTING FRAMES

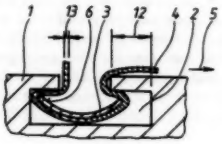
Elmar Messerschmitt, Paul-Hösch-Str. 13, 8000 München, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,261

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239319

Int. Cl.[3] **D06C** *3/08;* **A47H** *13/00*

U.S. Cl. 24—460 **9 Claims**



1. A clamping device for a printing frame for tensioning sheet type material, comprising a tension bar having a c-shaped longitudinal groove with front and rear undercuts; and a clamping strip consisting of resilient material and holding said sheet type material in said groove under unilaterial tension, wherein said clamping strip is concave toward an opening of said groove and the width of the opening of said groove plus said rear undercut are less than the thickness of said sheet type material plus the width of the clamping strip.

4,539,735

SNAP-FIT BUTTON ASSEMBLY

Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1983, Ser. No. 556,897

Claims priority, application Japan, Dec. 1, 1982, 57-182340[U]

Int. Cl.[3] **A44B** *17/00*

U.S. Cl. 24—621 **5 Claims**

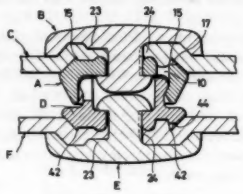
1. A snap-fit button assembly for attachment to a garment having two fabric pieces, comprising:

(a) a male and a female member molded and adapted to be coupled with one another;

(b) two tack members adapted to be joined with said male and female members, respectively, for attachment of the latter to the two fabric pieces separately, each of said tack members including a head and a central shank;

(c) said male member including a first base and a cylindrical plug integral therewith and defining a first axial bore, said first base having a first aperture opening into said first axial bore for reception of the central shank of one of said tack members, said plug having a plurality of outwardly directed locking projections around its free end portion;

(d) said female member including a second base and a cylindrical socket integral therewith and defining a second axial bore receptive of said plug of said male member, said second base having a second central aperture opening into said second bore, said socket having a plurality of inwardly directed locking projections around its free end portion engageable with said outwardly directed locking projections of said plug of said male member when said male and female members are coupled together; and



(e) said second base further having a plurality of openings, each communicating with said second bore and aligned with a respective one of said inwardly directed locking projections in a direction parallel to the axis of said socket.

4,539,736

BUCKLE FOR A WATCH BAND

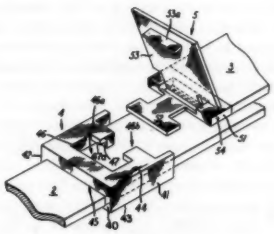
Koichi Yokosuka, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Sep. 4, 1981, Ser. No. 299,529

Claims priority, application Japan, Sep. 29, 1980, 55-138625

Int. Cl.[3] **A44B** *11/25*

U.S. Cl. 24—644 **22 Claims**



1. A buckle for a watchband comprising: a stopper fixture slidably mounted on one end of a band; and a linking member fixed to the other end of the band to join to said stopper fixture, wherein said stopper fixture includes a pair of side plates, a bottom plate and a top plate, said top plate having a joint opening in the shape of a wide opening connected to a narrow opening in the direction of the band, said stopper fixture having an inverted L-shaped step portion formed at the edge and under the border portion of the wide opening and the narrow opening, said linking member being substantially in the shape of the joint opening of the stopper fixture and having a linking tongue of a thickness to engage said step portion, and an upper rotatable cover to cover the engaged combination of the linking tongue and the joint opening, the under surface of said upper cover having a protruding member dimensioned and positioned to be pressed into the clearance formed when the linking tongue is disposed in the joint opening and slides in the band direction to engage said step portion.

4,539,737

METHOD FOR INSTALLING A MOTOR-COMPRESSOR UNIT IN A COOLING DEVICE

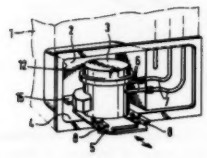
Werner Kerpers, Bingen; Werner Bonk, Mörfelden; Dieter Röser, Lohfelden, and Hans-Jürgen Führer, Gudensberg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,771

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318448

Int. Cl.³ B23P *17/00*; F16M *1/00*; F25D *23/00*

U.S. Cl. 29—423 18 Claims



1. An apparatus for mounting a motor-compressor unit in a compartment equipped with first conduits for circulating coolant, said compartment having a rear compartment wall, a compartment opening, and a compartment bottom between the compartment opening and the rear compartment wall, said motor-compressor unit having a bottom and second conduits for connection with said first conduits, comprising:

a mounting plate having a front end, a back end, and a substantially straight side between the front and back ends;

elongated rail means mounted on the bottom of the motor-compressor unit for slidably supporting the motor-compressor unit on the mounting plate, said rail means having a front end, a back end, and a side disposed between the front and back ends and configured to be slidably guided by the substantially straight side of the mounting plate;

means cooperating with the mounting plate for temporarily securing the mounting plate adjacent the compartment bottom with the back end of the mounting plate oriented toward the rear compartment wall and with the front end of the mounting plate extending through the compartment opening to support said rail means and the motor-compressor unit mounted thereon at least partially outside the compartment opening while the first and second conduits are manually connected, the back end of the rail means being oriented toward the rear compartment wall and the side of the rail means slidably engaging the substantially straight side of the mounting plate;

means extending from the rear compartment wall and spaced above the compartment bottom by a distance at least as great as the thickness of the mounting plate for automatically securing the back end of the rail means when the rail means and motor-compressor unit mounted thereon are manually slid into the compartment following the connection of the first and second conduits; and

means disposed adjacent the compartment opening for securing the front end of the rail means to mount the motor-compressor unit in the compartment after the mounting plate is manually removed.

4,539,738

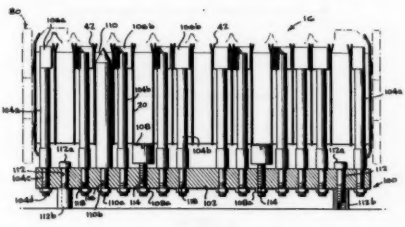
STRAP AND VANE POSITIONING FIXTURE FOR FUEL ROD GRID AND METHOD

Ronald F. Antol, North Huntingdon Township, Westmoreland County; Ralph W. Kalkbrenner, Irwin, and Richard M. Kobuck, Delmont, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,197

Int. Cl.³ B23Q *3/00*

U.S. Cl. 29—467 10 Claims



1. For use in the welding of a grid comprising sets of spaced, parallel and slotted straps, said straps of one set being substantially perpendicular to the straps of the other set, and the straps of each set entering the slots of the straps of the other set, said straps having vanes on one side of said grid extending at an angle to said straps, the strap of said one set of straps having said slots extending thereinto from the same edge from which the vanes extend;

a strap and vane positioning fixture comprising a plate, and means on said plate for engaging vanes of straps having said slots extending from the same edge as said vanes, and for moving into alignment segments of said straps between said slots which have vanes extending therefrom, with said means on said plate comprising a plurality of substantially parallel rods extending from said plate, and means on each of said rods for engaging at least one vane, with said means on each of said rods comprising a spade mounted at the distal end of each said rod.

4,539,739

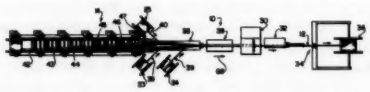
APPARATUS FOR MAKING ARMORED ELECTRICAL CABLE

John E. Himmelberger, Seymour, and James O. Scharf, Oxford, both of Conn., assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Dec. 29, 1983, Ser. No. 566,556

Int. Cl.³ H01B *13/20*; B23P *23/00*

U.S. Cl. 29—564.1 23 Claims



1. An apparatus for making an armored electrical cable from a plurality of electrical conductors and a plurality of reinforcing struts, the combination comprising:

a plurality of reels, each carrying a strut thereon;

conveyor means for conveying the struts from said reels in a feeding direction;

a second plurality of reels, each carrying a conductor thereon;

positioning means, located downstream of said conveyor means, for receiving the struts from said conveyor means and the conductors from said second plurality of reels, and for converging the struts and the conductors;

guide means, located downstream of said positioning means,

for receiving the converged struts and conductors from said positioning means and for combining the struts and the conductors;

armor means, located downstream of said guide means, for applying a tape of armor over the combined struts and conductors to complete the armored cable;

pulling means, located downstream of said armor means, for pulling the armored cable in the feeding direction; and

a take-up reel, located downstream of said pulling means, for receiving the armored cable from said pulling means.

4,539,740

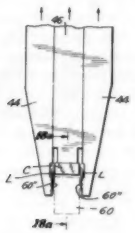
INSERTER DEVICE FOR ELECTRONIC COMPONENTS

DeHart G. Scrantom, Shallotte, N.C., and E. David Shealey, Myrtle Beach, S.C., assignors to AVX Corporation, Great Neck, N.Y.

Continuation-in-part of Ser. No. 368,670, Apr. 15, 1982, Pat. No. 4,455,735. This application Dec. 1, 1983, Ser. No. 556,982

Int. Cl.[3] **H05K** *3/30, 13/04*

U.S. Cl. 29—564.1 **5 Claims**



1. Apparatus for the automatic insertion into a PC board or the like positioned at an insertion station of an electronic component having a central body portion and axially extending leads projecting beyond the opposite ends of said body portion comprising a component forming station, means for feeding seriatum a sequence of said components to said forming station along a first path, an anvil member movably mounted at said forming station, said anvil member including a support surface defining a portion of said station, the transverse dimension of said support surface being not substantially greater than the length of said body portion, an applicator assembly movable toward and away from said insertion station along an insertion path intersecting said forming station, said applicator assembly including a bifurcate member having tines spaced apart a distance greater than the length of said body portion and less than the length of said leads, means for shifting said bifurcate member toward said insertion station along said insertion path to a position in spanning relation of said support surface whereby the said leads of a component on said support surface are deflected to a position at right angles to said body portion and are directed toward said insertion station, and means for shifting said support surface of said anvil to a posiion clear of said insertion path following deflection of said leads, whereby a component having deformed said leads is advanced between said tines through said forming station and toward said insertion station.

4,539,741

JOSEPHSON JUNCTION ELEMENT AND METHOD OF MAKING THE SAME

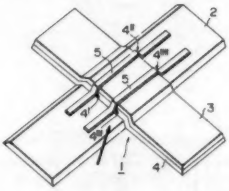
Hiroshi Ohta, Wako, Japan, assignor to Rikagaku Kenkyusho, Japan

Continuation-in-part of Ser. No. 151,693, May 20, 1980, Pat. No. 4,366,494. This application Oct. 11, 1983, Ser. No. 540,811

Claims priority, application Japan, Oct. 31, 1980, 55-153464; Dec. 20, 1980, 55-181045; Dec. 20, 1980, 55-181046; Dec. 20, 1980, 55-181047

Int. Cl.[3] **H01L** *39/22, 45/00, 49/02, 27/12*

U.S. Cl. 29—569 R **7 Claims**



1. A method for manufacturing a Josephson junction element, comprising the steps of forming a first strip-like superconductor thin film on a substrate, forming an insulator layer on said first strip-like superconductor thin film in crossing relation thereto, forming a second strip-like superconductor thin film on said insulator layer in overlapping relation thereto, subjecting said second strip-like superconductor thin film thus produced to sputter-cleaning, and then forming a thin film of weak link material which crosses over and covers the second superconductor thin film over the crossing area of the second strip-like superconductor thin film and extends across both sides of the thickness of the insulator layer exposed between said crossing first and second superconductor thin films.

4,539,742

SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

Koichi Kanzaki, Kawasaki, and Minoru Taguchi, Oomiya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 18, 1982, Ser. No. 389,931

Claims priority, application Japan, Jun. 22, 1981, 56-96203; Jul. 24, 1981, 56-116082

Int. Cl.[3] **H01L** *21/225, 21/302*

U.S. Cl. 29—576 W **8 Claims**

1. A method for manufacturing a semiconductor device, comprising the steps of:

(a) forming a first impurity region of a second conductivity type in a semiconductor layer of a first conductivity type which is formed above a semiconductor substrate;

(b) selectively forming a conductive film of said first conductivity type on a portion of said first impurity region, said film being covered by a first insulating layer;

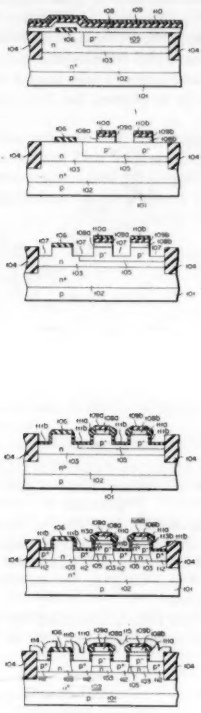
(c) forming a groove by anistropically etching portions of said first impurity region using said first insulating layer as a mask, thereby defining a projecting region supporting said conductive film and said first insulating layer and having side surfaces extending below said conductive film;

(d) forming a second insulating layer covering the grooved surface formed in step (c);

(e) forming a second impurity region of said second conductivity type at the bottom of said groove;

(f) selectively etching said second insulating layer to leave

said second insulating layer on the side surfaces of said groove defining said projecting region; and



(g) depositing a wiring layer electrically connected to said second impurity region.

4,539,743

PRODUCTION OF SEMICONDUCTOR STRUCTURES WITH BURIED RESISTIVE OR CONDUCTIVE REGIONS BY CONTROLLED ION BOMBARDMENT AND HEAT TREATMENT

Philip J. Anthony, Bridgewater; Robert L. Hartman, Warren; Louis A. Koszi, Scotch Plains, and Bertram Schwartz, Westfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

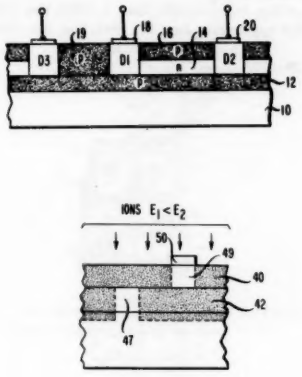
Filed Nov. 28, 1983, Ser. No. 555,506
Int. Cl.[3] H01L *21/263, 21/26*
U.S. Cl. 29—576 B **11 Claims**

1. A method of manufacturing a device comprising the steps of

(a) providing a multi-layered Group III-V compound structure which includes a first layer having a first dopant and a second layer having a second dopant,

(b) ion bombarding said layers at a dose and energy so that said layers become highly resistive, the resistivity of said first layer remaining high when heated to a first temperature and thereafter decreasing to a relatively low resistivity, and the resistivity of said second layer remaining high when heated to a second temperature, different from said first temperature, and thereafter decreasing to a relatively low resistivity, and

(c) simultaneously heating said layers at a temperature between said first and second temperatures so that one of



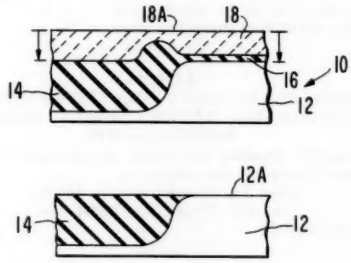
said layers becomes lowly resistive while the other of said layers remains highly resistive.

4,539,744

SEMICONDUCTOR PLANARIZATION PROCESS AND STRUCTURES MADE THEREBY

Greg Burton, Mountain View, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Feb. 3, 1983, Ser. No. 576,665
Int. Cl.[3] H01L *21/95*
U.S. Cl. 29—580 **19 Claims**



19. A method of making a semiconductor structure, comprising the steps of:

(a) providing a semiconductor substrate having at least one substantially planar surface, said substrate comprising silicon,

(b) forming an electrically insulating pattern adjacent said surface, said insulating pattern comprising silicon dioxide and including at least one portion thereof which extends outward beyond and away from said remaining planar surface,

(c) depositing a film of electrically insulating material over said surface, and said portions, said material comprising germanosilicate glass,

(d) planarizing said film of step (c)

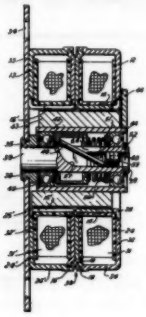
(e) wet etching said film of step (c) and said electrically insulating pattern of step (b), and

(f) terminating the etching step when a predetermined thickness of said film of step (c) and said electrically insulating pattern of step (b) have been etched.

4,539,745
METHOD OF ASSEMBLING A MOTOR HAVING STATIONARY SHAFT

Harry G. Manson, Princeton, Ind., assignor to IMC Magnetics Corp., Jericho, N.Y.

Division of Ser. No. 356,060, Mar. 8, 1982, Pat. No. 4,480,206.
This application Jun. 11, 1984, Ser. No. 619,711
Int. Cl.³ H02K *15/00*
U.S. Cl. 29—596 2 Claims



1. A method of assembling the rotor and shaft of an electric motor, comprising the steps of:

providing a shaft having an axial bore communicating with a radial slot in the shaft, the bore terminating in an inclined surface extended to the slot,

placing an annular rotor around the shaft with two bearings between the rotor and shaft, the bearings being spaced apart along the length of the shaft,

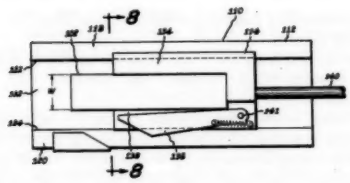
inserting an elongated locking member into the bore, and advancing the locking member to cause one of its ends to slide along the inclined surface and outwardly through the slot, until that end of the locking member operatively engages one of the bearings, and

fixing the locking member in place.

4,539,746
MEANS FOR PRESENTING AN ELECTRODE OF A RECHARGEABLE ELECTROCHEMICAL CELL TO A WINDING ARBOR

Raymond K. Sugalski, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Sep. 10, 1984, Ser. No. 648,921
Int. Cl.³ H01M *10/06;* B65H *9/00*
U.S. Cl. 29—730 9 Claims



1. In a machine having a pair of arbors rotatable about an axis for winding an electrode assembly having at least one electrode strip with a separator material disposed adjacent thereto, the improvement comprising:

a carrier member adapted for movement toward and away from said pair of arbors;

guide means for supporting and guiding said carrier member during said movement;

means disposed on said carrier member for receiving said electrode strip and for aligning said electrode strip for presentation to said winding arbors, said receiving and aligning means defining a recess having a variable width variable from a first width substantially larger than the width of said electrode strip to a second width substantially equal to said width of said electrode;

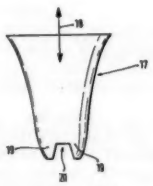
means for varying the variable width of said variable recess from said first width wherein said electrode strip may be inserted in said recess to said second width wherein said electrode strip is aligned for said presentation to said arbors; and

carrier moving means for moving said carrier member toward and away from said pair of arbors, said carrier moving means moving said carrier member in close proximity to said arbors whereby said electrode strip is presented to said arbors.

4,539,747
PROCESS FOR MAKING ELECTRICAL CONNECTIONS BETWEEN TWO SURFACES OF A PRINTED CIRCUIT BOARD

Helmut Stein, Diekholzen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE83/00019, § 371 Date Jul. 14, 1983, § 102(e) Date Jul. 14, 1983, PCT Pub. No. WO83/03182, PCT Pub. Date Sep. 15, 1983
PCT Filed Feb. 2, 1983, Ser. No. 522,305
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207585
Int. Cl.³ H01K *3/00*
U.S. Cl. 29—846 5 Claims



1. Process for making electrical connections between an upper surface and a lower surface connected by side surfaces of a printed circuit board having edges, the process comprising the steps of: providing an elastically deformable printing stamp having a portion capable of embracing an edge of the printed circuit board in a direct contact with the upper surface, the lower surface and a side surface connecting the upper and lower surfaces in the region of an edge; providing an electrically conductive coating material on said embracing portion of said printing stamp; and directly contacting said embracing portion with the upper surface, the lower surface and a side surface connecting the upper and lower surfaces in the region at least one of the edges of the circuit board so as to cause printing of the electrically conductive coating in selected positions on of said upper, lower and side surfaces in the region of at least one of the edges of the circuit board so as to connect electrically said upper and lower surfaces of the printed circuit board.

4,539,748

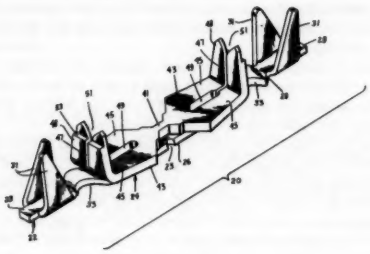
METHODS OF MAKING AN ELECTRICAL CONNECTOR

Robert J. Brown; Douglas R. Fernandez, both of Lawrenceville, and Charles McGonigal, Grayson, all of Ga., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 403,906, Jul. 30, 1982, Pat. No. 4,472,596. This application Jul. 2, 1984, Ser. No. 626,800

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—874 **4 Claims**



1. A method of making an electrical connector, said method including the steps of:

moving a strip of metallic material through a plurality of workstations;

removing material from the strip to form a blank including contact element means which includes two opposed beams connected together electrically and having bifurcated first end portions with the furcations of each bifurcated end portion having a conductor-receiving slot formed therebetween, the blank also having a frame which includes lateral portions extending transversely across the strip for supporting said contact element means and being connected to second end portions of the beams and which is connected at each end to an end portion of the connector along which are formed tangs for securing a conductor to the connector;

separating each blank from the strip;

causing portions of the first end portions of the beams to project from the plane of the blank;

bending the tangs at each end of the connector out of the plane of the blank to cause them to be adapted to receive a conductor and adapted to be wrapped about the conductor; and

forming an offset in each end portion of the connector between the tangs at that end and the frame.

4,539,749

PORTABLE KNIFE EQUIPPED WITH A SPOON AND A FORK

Shin Hyeong-Woon, 10-25, Bougcheon 3-Dong, Kwanak-ku, Seoul, Rep. of Korea

Filed Mar. 14, 1984, Ser. No. 589,424

Claims priority, application Rep. of Korea, Aug. 17, 1983, 7213/1983

Int. Cl.³ B26B *1/02, 1/08*

U.S. Cl. 30—147 **6 Claims**

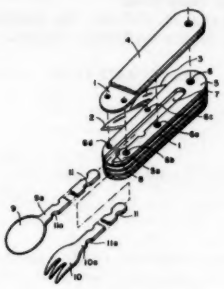
1. A portable knife, comprising:

a plurality of elongated plates extending in a longitudinal direction;

means for joining the plurality of elongated plates together into a layered assembly in which the individual plates are co-extensive, at least one of said plates including a pair of elongated, parallel legs extending in the longitudinal direction which define a pocket between them open at one end, one of said legs being displaceable transversely to the longitudinal direction;

a knife pivotably mounted at one end of the assembly; and

a utensile including an elongated portion which is received through the open end of said pocket, longitudinally into said pocket and retained therein, said displaceable leg



being displaceable transversely outwardly from the assembly to receive said elongated portion.

4,539,750

ICE CUTTER AND CORER

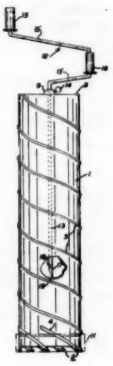
Reino E. Jarvi, P.O. Box 38, Foleyet, Ontario, Canada P0N 1T0, and Phillip G. L. Tremblay, P.O. Box 852, Timmins, Ontario, Canada

Filed May 24, 1983, Ser. No. 497,700

Claims priority, application Canada, Nov. 22, 1982, 416078

Int. Cl.³ B25F *3/00*; F25C *5/04*; B23B *41/00*

U.S. Cl. 30—300 **6 Claims**



1. A combined ice-cutter and corer including:

(a) a hollow cylindrical body having an open lower end and a substantially closed upper end;

(b) a plurality of downwardly projecting ice cutting teeth arranged around the perimeter of the lower end of said body;

(c) handle means on the upper end of said body for manually rotating said body;

(d) a pair of primary lands extending helically upwardly on the outer surface of said body from a diametrically opposed pair of said teeth to said upper end; and

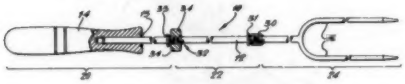
(e) a pair of secondary lands each being located midway between a pair of primary lands and extending helically upwardly on the outer surface of said body from a diametrically opposed pair of said teeth part way up said body;

whereby rotation of said body during a cutting operation causes said teeth to cut an ice core for entry into said body, and ice-swarf cut by said teeth is removed by said lands.

4,539,751
BARBEQUE FORKS

Siu-Por Chan, Room 805, 8th Floor Yat King House, Lai King Estate, Kowloon, Hong Kong

Filed Oct. 25, 1983, Ser. No. 545,096
Claims priority, application United Kingdom, Nov. 1, 1982, 8231191
Int. Cl.³ A47J 43/28
U.S. Cl. 30—322 6 Claims

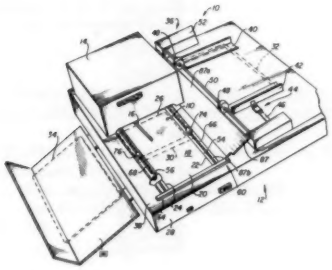


1. A barbeque fork comprising a shaft, a handle at one end of said shaft, prongs for supporting food at the other end of said shaft, said shaft being capable of being separated into a number of shorter lengths for storage, connecting means for holding said lengths assembled end-to-end for use, said connecting means comprising a screw-threaded spigot formed by screw-threading on one end of one length and a corresponding internally screw-threaded socket formed in a collar joined on the end of an an adjacent length, and a flange attached to said end of said one length, said flange abutting said socket to limit the extent to which said screw-thread can enter said corresponding socket so that the end of said one length does not touch the end of said adjacent length.

4,539,752
AUTOMATIC SHEET TRANSPORT MECHANISM

John C. Beery, and Kenneth Witzke, both of Locust Grove, Va., assignors to E.S.P. Systems, Inc., Locust Grove, Va.

Filed Aug. 12, 1983, Ser. No. 522,588
Int. Cl.³ B43L 13/00
U.S. Cl. 33—18 B 15 Claims



1. An automatic sheet transport mechanism for an automatic signature writing machine comprising:

a flat, rectangular writing surface disposed in a horizontal plane and upon which a sheet rests while being written on, said writing surface having longitudinal sides, a leading lateral side, and a trailing lateral side;

a writing instrument located vertically above said writing surface which is movable into and out of engagement with said writing surface in a defined writing area to write a desired message;

a sheet positioning means for accurately positioning the sheet on said flat surface including

a. a leading driving roller and a trailing driving roller located adjacent respective leading and trailing sides of said writing surface, each of said driving rollers being elongate, extending longitudinally of said writing surface, and having a top edge tangent to the horizontal plane of said writing surface,

b. a motor means for rotating said leading and trailing rollers such that the respective top edges of said rollers rotate toward and away from said writing surface,

c. a leading shaft and a trailing shaft located vertically above respective said leading and trailing rollers, and

d. a pair of leading wheels and a pair of trailing wheels mounted on respective said leading and trailing shafts such that said wheels rotatably contact a respective roller, said wheels being freely rotatable on said shafts and adjustably positionable longitudinally relative to said shafts whereby the sheet is located between respective said rollers and wheels such that the rotation of said rollers cause the sheet to move laterally relative to said writing surface;

a sheet feeding means positioned adjacent said leading roller for removing a single sheet from a stack of sheets and for advancing the single sheet between said leading driving roller and associated leading wheels; and

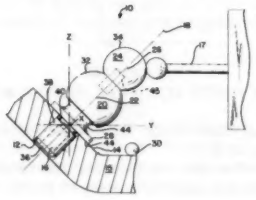
a control means for cyclically controlling the actuation of said motor means, said sheet feeding means, and said writing instrument such that the single sheet from the stack is moved by said sheet feeding means to said sheet positioning means and thereby to the writing area of said writing surface where said writing instrument writes the desired message, and thereafter said sheet positioning means is actuated to move the single sheet off of the trailing side of said writing surface and the cycle is then repeated;

said sheet positioning means further including a common mounting means for said leading shaft and said trailing shaft, said common mounting means comprising means for preventing said shafts from moving horizontally and for providing a free floating mounting for said shafts such that said shafts can move freely in a vertical direction, said wheels supporting said mounting means by exerting pressure on said respective driving rollers, said pressure being substantially equal to and determined by the weight on said wheels.

4,539,753
INSPECTION TOOL

John F. Fitzpatrick, 801 NW. 54th St., Apt. 8, Seattle, Wash. 98107

Filed Apr. 18, 1983, Ser. No. 485,897
Int. Cl.³ G01B 5/25
U.S. Cl. 33—169 C 18 Claims



1. An inspection tool for use with a coordinate measuring machine to determine the location of a hole in a surface, comprising:

centering means for holding the tool in fixed relative relation to the hole during tool usage, and providing a reference line in alignment with the center line of the hole, said centering means having a member positionable in the hole;

first means measurable by the machine for determining coordinates of a first point aligned along said reference line, said first means being attachable to said centering means and having a substantially spherical surface portion positionable external of the hole and having a center point coincident with said first point; and

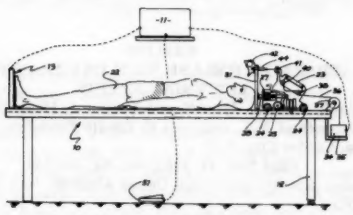
second means measurable by the machine for determining coordinates of a second point aligned along said reference line, distant from said first point, said second means being attachable to said first means and having a substantially spherical surface portion positionable external of the hole and having a center point coincident with said second point, said substantially spherical surface portions of said first and second means having differing radii of curvature, whereby said coordinates of said first and second points may be used to determine the center line of the hole, the coordinates of the point of intersection of the center line with the known plane of the surface being the location of the hole.

4,539,754

AUXOLOGICAL MEASURING APPARATUS

Gabriel Antony, Coogee, and Richard B. Frost, Eastwood, both of Australia, assignors to Unisearch Limited, Eastwood,

Filed Oct. 17, 1983, Ser. No. 542,893
Claims priority, application Australia, Oct. 15, 1982, PF6369
Int. Cl.³ G01B *7/02*
U.S. Cl. 33—169 R **6 Claims**



1. An auxological measuring apparatus comprising a table having a flat, smooth horizontal surface, a foot contact means including a surface extending approximately normally to the surface of the table and against which the soles and heels of the feet of a human subject to be measured lying on the table are to be placed, means moveable linearly on the table surface selectively towards and away from the foot contact means and adapted to be brought into contact with the top of the subject's head, electronic transducer means associated with said moveable means constructed and arranged to produce an electric signal indicative of the distance between said moveable means and the surface of the foot contact means and thus of the height of the subject, electronic circuitry arranged to process said signal and provide a visible indication of said distance, said electronic transducer means being operable through a cable attached to the moveable means through graspable means removably attached to said moveable means and including a pointer, whereby the graspable means may be detached from the moveable means and utilized for measurement of the positions of medial anatomic features of the subject.

4,539,755

TURBINE COMPRESSOR CLEARANCE INDICATOR DEVICE AND METHOD OF USING SAME

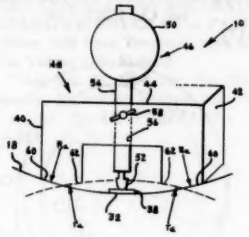
Daniel V. Weimer, 423 S. Washington St., Milford, Del. 19963

Filed Jun. 6, 1984, Ser. No. 617,664
Int. Cl.³ G01B *5/08, 5/20*
U.S. Cl. 33—172 R **2 Claims**

1. A clearance indicator device for use in measuring rotor blade/stator vane clearances in jet turbine engines, said device comprising:

a dial indicator, said indicator having a plunger that moves within a housing attached to a meter, said plunger and said meter indicating distance moved, and

a holder, said holder having two feet and a connecting member between said feet, said connecting member having a hole therethrough for selectively holding said housing of said indicator, said feet having on each an outer convex surface and an inner concave surface, both being rectangular shaped and positioned at an obtuse angle to



each, said holder being vertically stable without further support, said convex surface having a radius of curvature defined by:

$$R_a = \frac{R_{max} + R_{min}}{2}$$

R_a being the average radius,
R_{max} being the maximum radius of a concave surface, and
R_{min} being the minimum radius of a concave surface; said concave surface having a radius of curvature defined by:

$$r_a = \frac{r_{max} + r_{min}}{2}$$

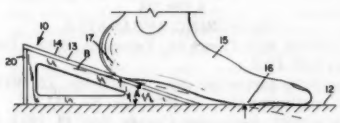
wherein said
r_a being the average radius of a convex surface,
r_{max} being the maximum radius of said convex surface,
r_{min} being the minimum radius of said convex surface.

4,539,756

MEASUREMENT OF PERIPHERAL STRENGTH

William M. Maykel, 36 Stark Rd., Worcester, Mass. 01602

Filed May 21, 1984, Ser. No. 612,346
Int. Cl.³ A61F *3/00*
U.S. Cl. 33—515 **4 Claims**



1. Method for measuring the point of heel elevation at which peripheral strength is lost, comprising the steps of:

(a) placing the patient to be tested in a standing position,

(b) supporting the balls of both feet,

(c) supporting both heels on a second surface, which surface is inclined at a selected angle to a flat horizontal first surface,

(d) changing in successive steps the foot angle between the first surface (on the one hand) and the plane of the balls of the feet and the heels (on the other hand), while measuring peripheral strength at each step, and

(e) observing the step at which the peripheral strength begins to decrease.

4,539,757

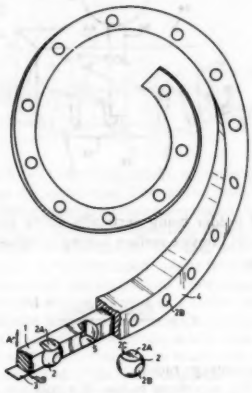
DRAWING IMPLEMENT

Shiang C. Shyu, No. 119, Kung Chien Rd., Kung Kuan, Miaoli Hsien, Taiwan

Filed Nov. 30, 1983, Ser. No. 557,344

Int. Cl.[3] H01F *1/00*

U.S. Cl. 33—177 3 Claims



1. A curve stripe drawing implement for use with a magnetic pad, said drawing implement comprising:

(a) an elongated soft metal core having a plurality of openings formed therein at intervals along the core;

(b) a plurality of magnetic beads having at least one flat surface, said beads being disposed in said openings in said core and being arranged such that said at least one flat metal surface is disposed normal to the elongated axis of the core and projects outwardly therefrom;

(c) a strip element which is rectangular in cross section and which is disposed adjacent said core and arranged to inhibit movement thereof in a direction normal to said at least one surface of said beads; and

(d) a pliable plastic jacket surrounding said core, said strip element and said beads, said jacket having openings therein matching said at least one surface of said beads.

4,539,758

MEASURING APPARATUS

Raine R. Riutta, 8326 French St., Vancouver, British Columbia, Canada V6P 4W2

Continuation-in-part of Ser. No. 367,197, Apr. 12, 1982,. This application Oct. 21, 1983, Ser. No. 543,797

Claims priority, application Canada, Sep. 18, 1981, 386200; Mar. 10, 1982, 398046

Int. Cl.[3] G01B *5/25*

U.S. Cl. 33—180 AT 23 Claims

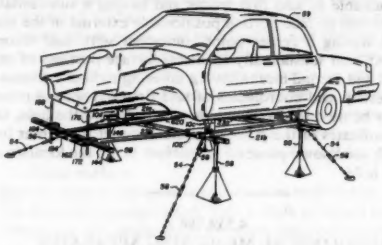
1. Measuring apparatus, comprising:

(a) a first extension member having a first end for affixation at a first reference point and having a second end extendible away from said first extension member first end;

(b) a second extension member having a first end for affixation at a second reference point and having a second end extendible away from said second extension member first end;

(c) a cross-member connectible between said second ends of said extension members;

(d) first indicator means on said first extension member for indicating displacement between said first and second ends of said first extension member; and,



(e) second indicator means on said second extension member for indicating displacement between said first and second ends of said second extension member.

4,539,759

APPARATUS FOR USE WITH DRY TRANSFER LETTERING SHEETS

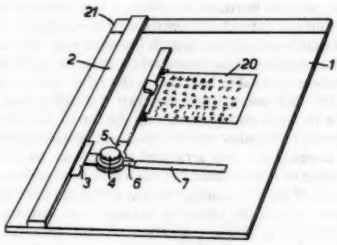
Martin E. Dowzall, Wycoff, and Vazgen J. Houssian, Union City, both of N.J., assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Nov. 19, 1982, Ser. No. 443,148

Claims priority, application United Kingdom, Nov. 20, 1981, 8135002

Int. Cl.[3] B41B *1/00;* B43L *13/24*

U.S. Cl. 33—184.5 4 Claims



1. Apparatus for use in conjunction with a dry transfer lettering sheet and a drawing board having a height in a vertical direction and including a drafting machine comprising a device for mounting a drawing accessory such as a scale, the device being capable of horizontal motion across the drawing board and a first motion in said vertical direction up and down the vertical height of said drawing board, and means being provided to brake the vertical motion of the device, the apparatus comprising a base member means for firm attachment to the mounting device on the drafting machine and a transfer sheet supporting means slidably mounted for a second motion thereof in said vertical direction relative to the base member means, when the base member means is mounted on the mounting device, and means for dividing said second vertical motion into a number of equally spaced steps, said dividing means comprising a vertically oriented linear track having a plurality of evenly spaced detents therein, at least one ball bearing, ball bearing retaining means for holding said ball bearing, carriage means affixed to said ball bearing retaining means and said transfer sheet supporting means, and spring means for pressing said ball bearing into said detents.

4,539,760

COMPASS

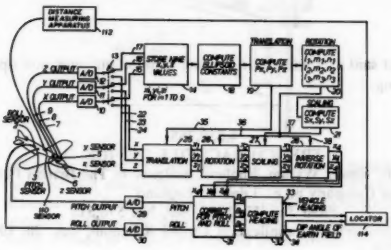
Brian G. Marchent, Portsmouth, and Michael R. Foster, Salisbury, both of England, assignors to Plessey Overseas Ltd., Ilford, England

Filed Oct. 12, 1983, Ser. No. 541,026

Claims priority, application United Kingdom, Oct. 12, 1982, 8229134

Int. Cl.³ G01C 17/38

U.S. Cl. 33—356 4 Claims



1. A navigation system for vehicles which includes an electronic compass comprising three magnetic sensors arranged in use to be respectively responsive to orthogonal components of a magnetic field which includes the earth's magnetic field and a spurious magnetic field which is associated with the vehicle, for producing electrical signals corresponding to said components, tilt sensor means responsive to vehicle tilt with respect to the horizontal plane, data processor and storage means arranged to store signals derived from the sensors as the vehicle is turned through a compass setting cycle, and signal processor means responsive to electrical signals produced by the sensors after the setting cycle has been completed and to the signals stored during the setting cycle, for providing compensated signals related to the bearing appertaining to the heading of the vehicle in which the effects of the spurious magnetic field are compensated for and further processor means to which the compensated signals are applied and which is responsive to the tilt sensor means for modifying the compensated signals to produce compass output signals appertaining to vehicle heading in which the effects of tilt are compensated for, the system including also, means for sensing the velocity of the vehicle in which the compass is mounted, data infeed means operable for providing data appertaining to an original map reference, navigation computer means responsive to data signals derived from the velocity indicator, the compass output signals, and the data infeed means for providing data for display means whereby the display means is arranged to provide a display indicative of the position or location of the vehicle.

4,539,761

METHOD OF USING SPENT CRACKING CATALYST AS A WASTE MATERIAL ABSORBANT

Robert Habermehl, Shelbyville, Ky., assignor to Mobile Companies Inc., Shelbyville, Kentucky

Filed Mar. 16, 1984, Ser. No. 590,528

Int. Cl.³ F26B 3/00

U.S. Cl. 34—9 5 Claims

1. A method of collecting a volume of liquid comprising the step of (a) bringing a predetermined volume of particles of untreated spent silica-alumina catalyst previously used in a fluid-bed type catalytic cracking process into intimate contact with a liquid and (b) allowing the particles to remain in contact with the liquid for a time sufficient for the particles to absorb a portion of the liquid; and (c) collecting said particles having said portion of said liquid absorbed therein, said predetermined volume of collected particles forming a nonflowable substantially solid mass.

4,539,762

POCKET VENTILATING APPARATUS FOR A MULTI-CYLINDER DRYER OF A PAPER MACHINE

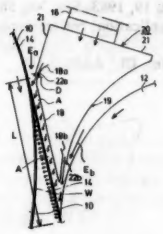
Pekka Eskelinen, and Vesa Vuorinen, both of Turku, Finland, assignors to Valmet OY, Finland

Filed Feb. 28, 1984, Ser. No. 584,341

Claims priority, application Finland, Mar. 1, 1983, 83 0675

Int. Cl.³ F26B 13/08

U.S. Cl. 34—114 3 Claims



1. In apparatus for ventilating a pocket present in a multi-cylinder dryer of a paper machine, the multi-cylinder dryer including upper and lower rows of drying cylinders wherein a web runs from cylinders in one row to cylinders in another row in open draws, guide rolls situated in spaces between adjoining drying cylinders, and at least one wire having a run guided by said guide rolls to cover the web as it passes over the surfaces of the drying cylinders of a respective one of said upper and lower rows, said wire having incoming and outgoing free runs prior to and following a guide roll situated between a pair of adjoining drying cylinders of said one of said upper and lower rows, the open draws of the web together with the uncovered surfaces of the drying cylinders and free runs of said wire defining said pockets between them, said pocket ventilating apparatus including means for blowing air into a respective pocket through the incoming free wire run thereof prior to the guide roll whereupon air is removed from said pocket at least partially through the outgoing free wire run thereof following the guide roll, and wherein said ventilating apparatus for a respective pocket includes nozzle apparatus situated proximate to said run of said wire, the improvement comprising:

said nozzle apparatus includes a nozzle nose defining at least two mutually spaced nozzles substantially facing said incoming free wire run of said pocket, each nozzle extending substantially transversely to the direction of run of said wire and arranged such that air is blown therethrough into a space defined by said incoming free wire run facing said nozzles, by said guide roll and by said nozzle nose, said mutually spaced nozzles thereby constitute means for generating a positive pressure in an area of said wire over a length and in the direction of run of said incoming free run, by the effect of which pressure, air flows within said area through said wire into said pocket,

said nozzle nose comprises a member extending in the direction of and facing said incoming free wire run, said nozzle nose member having opposite transversely extending edges proximate to upstream and downstream parts of said incoming free wire run respectively, and wherein said nozzles are located at both of said opposite edges of said nozzle nose member, and

wherein said nozzle apparatus further include outer walls, said outer walls having portions which together with said nozzle nose member define first and second nozzle slots constituting said nozzles situated at said opposite edges of said nozzle nose member, said first nozzle slot being situ-

ated proximate to said upstream part of said incoming free wire run and constituting means for blowing air into said space in a direction substantially parallel to the direction of run of said incoming free wire run, and said second nozzle slot being situated proximate to said downstream part of said incoming free wire run and constituting means for blowing air in a direction substantially parallel to a tangent to said guide roll.

4,539,763

ATHLETIC FOOTWEAR, IN PARTICULAR A SKI BOOT

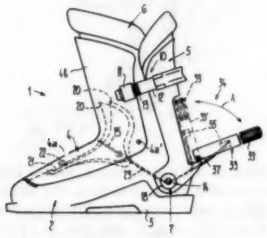
Klaus Walkhoff, Kreuzlingen, Switzerland, assignor to Raichle Sportschuh AG, Kreuzlingen, Switzerland

Filed Dec. 19, 1983, Ser. No. 563,042

Claims priority, application Switzerland, Dec. 27, 1982, 7560/82

Int. Cl.³ A43B *5/04*

U.S. Cl. 36—120 **25 Claims**



1. An article of athletic footwear, especially a ski boot having a longitudinal axis and comprising:

a shell member;

a rear upper portion having an outer side and cooperating with said shell member;

pivot means for mounting said rear upper portion on said shell member for pivotal movement about a pivot axis extending substantially perpendicular to the longitudinal axis of the boot;

a pressure pad arranged within the shell member of the boot and intended to act upon the foot of the wearer;

tensioning means attached to said rear upper portion at said outer side for forcing the pressure pad against the foot of the wearer; and

connecting means arranged between the pressure pad and the tensioning means constructed such that the force governed by the tensioning means and acting upon the foot of the wearer is substantially independent of the angular position of the rear upper portion of the boot.

4,539,764

ADJUSTMENT APPARATUS FOR SKI BOOT

Serge Pradier, Alby-sur-Cheran, France, assignor to Salomon S.A., Annecy, France

Filed May 25, 1983, Ser. No. 497,840

Claims priority, application France, Jun. 2, 1982, 82 09984

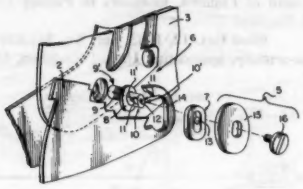
Int. Cl.³ A43B *5/04*; F16B *1/00*

U.S. Cl. 36—121 **54 Claims**

1. An adjustment apparatus for a ski boot having a shank member rotatable about an axis, a shell base member, and a journal element attached to one of said members around which said shank member is journalled, wherein said apparatus comprises means for changing the orientation of said axis around which said shank member rotates, and wherein said means comprises:

a body attached to the other of said members and having a slot therein; and

a frame engaging said slot and having an opening therein for receiving said journal element, wherein said frame comprises means for changing the position of said frame within said slot in such a manner so as to change the position of said opening, thereby changing the orientation



of said axis when said journal element engages said opening.

4,539,765

TRENCH BACKFILL DEVICE

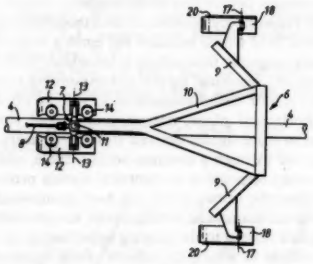
Alan R. Reece, Wylam, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Jan. 13, 1984, Ser. No. 570,515

Claims priority, application United Kingdom, Jan. 20, 1983, 8301515

Int. Cl.³ E02F *5/22*

U.S. Cl. 37—142.5 **3 Claims**



1. A device for back-filling a trench with spoil, the device comprising a forecarriage having pivotally mounted skids adapted to fit into the trench in contact with the walls thereof to locate the forecarriage centrally in the trench and a main frame located behind the forecarriage and connected thereto by a pivot means, the forecarriage comprising one or more pairs of rollers mounted on said skids and adapted to engage with a pipeline laid in the trench and thereby guide the device, the main frame carrying one or more angled blades and lateral stabilisers adapted to contact the ground outside the soil, the said stabilisers being adapted to provide a force which in the event that the said main frame tries to move to an angle to the line of the trench, will tend to restore the main frame so that it travels in the direction of the line of the trench.

4,539,766

MERCHANDISE INFORMATION TAG

Jacob Fast, 7561 NW. St., Plantation, Fla. 33317

Continuation-in-part of Ser. No. 358,925, Mar. 17, 1982. This application Sep. 23, 1982, Ser. No. 422,010

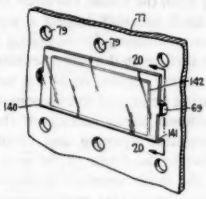
Int. Cl.³ G09F *3/12*

U.S. Cl. 40—22 **16 Claims**

1. An article of manufacture in the form of a product identification tag for use in conjunction with display means adapted to suspend merchandise for display, which display means includes a support member adapted to engage a separate support structure along at least one lineal path of predetermined length, said identification tag comprising an integral plastic member having a first portion of predetermined configuration adapted

to receive a label, said tag having a second portion through which a slot is defined with at least one dimension at least as long as said predetermined length, wherein said tag is supportable by said support member adjacent said support structure and behind said merchandise by inserting said support member through said slot along said lineal path to engage said support structure;

wherein said first and second tag portions are integrally



joined by a stem portion having a dimension parallel to said one slot dimension which is less than said one slot dimension to thereby define two cut-away tag portions on opposite sides of the stem portion, said cut-away portions being defined as respective further slots extending parallel to said one dimension; and

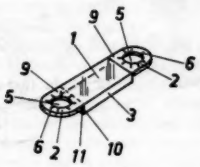
wherein said first tag portion is a label-receiving pocket formed by folding said first portion about a fold line extending parallel to said one slot dimension.

4,539,767

DEVICE FOR THE MARKING OF ELECTRICAL WIRES AND CABLES, PIPES

Walter Jaffe, Pl. 6530 Skaven, S-531 00 Lidkoping, Sweden

Continuation-in-part of Ser. No. 345,358, Feb. 3, 1982, abandoned. This application Dec. 8, 1982, Ser. No. 447,986
Claims priority, application Sweden, Jun. 23, 1981, 8103918
Int. Cl.³ G09F *3/00*
U.S. Cl. 40—316 **3 Claims**



1. A device for the marking of elongated objects such as electrical single wires or cables, tubes, pipes or the like and comprising a substantially flat oblong piece of material having an intermediate portion and end portions, said end portions being provided with openings and being capable of bending relative to said intermediate portion for moving said openings into substantially axial alignment, said intermediate portion being hollow and having open ends for receiving a marking element and said end portions, when bent, covering said open ends of said hollow intermediate portion.

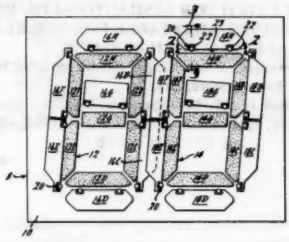
4,539,768

DIGITAL DISPLAY APPARATUS

John J. Halliday, 8 McAdam Dr., Enfield, Middlesex, England

Filed Jun. 15, 1984, Ser. No. 621,178
Int. Cl.³ G09F *3/04*
U.S. Cl. 40—447 **8 Claims**

1. A digital display apparatus comprising a board having one or more seven-element displays marked thereon, a flap for selectively covering and uncovering each element of the display, and pivot means connecting said flaps to said board, said flaps being manually pivotal from a first position in which the associated element is exposed, to a second position in which it covers the associated element, said pivot means comprising spaced apertured stud members positioned in a slot adjacent the edge of the flap and spring means, said stud members being



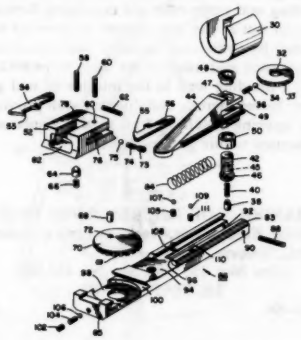
mounted in spaced apertures in said board with each flap and said spring means resiliently retaining each of said flaps in said first or second position, whereby selective pivoting movement of the individual flaps enables the elements to form and display any required digit from 0 to 9.

4,539,769

MOUNT FOR ATTACHING A DEVICE TO A FIREARM

Frederick G. Stevens, Bridgeport, Conn.; Robert J. Heideman, Livonia, and Jerry B. Holden, Plymouth, both of Mich., assignors to Hydra Systems International, Inc., Bridgeport, Conn.

Filed Jun. 2, 1983, Ser. No. 500,417
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—1 A **19 Claims**



1. A mount for attaching a device to a firearm comprising:

a longitudinal base adapted to carry the device to be mounted and having a track extending along a portion of the length thereof;

a block slidably mounted in said track;

spring means for biasing said block toward one end of said base;

first means mounted to said block for attachment to a first fixed member at one end of a firearm barrel; and

second means for attaching the other end of said base to a second fixed member at the other end of the firearm barrel;

whereby the device is mounted by attaching said first means to said first fixed member, sliding the base forward relative to said block until said second means is in a position to be attached to the second fixed member, aligning said second means with said second fixed member, and releas-

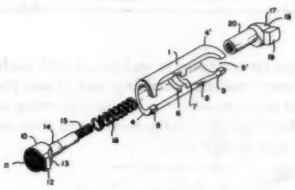
ing said mount to cause the base to slide rearward with respect to the block in response to the biasing action of said spring means, thereby engaging said second means with said second fixed member.

4,539,770

PRESSABLE LATCH FOR SEMIAUTOMATIC PISTOL MAGAZINES, ADAPTABLE FOR USE BY LEFT-HANDED PERSONS

Jose C. M. Bornancini, Porto Alegre, Brazil, assignor to Forjas Taurus S.A., Porto Alegre, Brazil

Filed Jun. 9, 1983, Ser. No. 502,711
Claims priority, application Brazil, Nov. 19, 1982, 6201580
Int. Cl.³ F41C *25/06*
U.S. Cl. 42—7 **6 Claims**



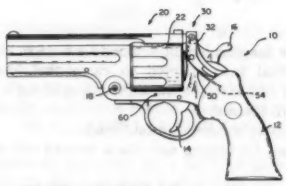
1. A pressable magazine latch for mounting in the frame of semiautomatic pistols and adaptable for use by left-handed persons including, a guide-tube anchored within a bore in the pistol frame behind the trigger, said guide-tube provided with two facets on its front periphery for preventing rotation thereof in said bore, a notch in said guide-tube receiving a pin for preventing withdrawal thereof from said frame bore, said faces bounding said guide-tube and coverging forwardly, said guide-tube cut out at the rear thereof to provide medial flat faces bounded by cylindrical surfaces, the rear of said guide-tube adjacent each said sideface cut away to provide a pair of guide slots, a dividing wall in the interior of said guide-tube forming two halves therein, said dividing wall provided with a rearwardly opening notch, and an axially displaceable latch member disposed within said guide-tube.

4,539,771

HANDGUN OF THE REVOLVER TYPE

Nahemia Sirkis, King County, Wash., assignor to Detonics Small Arms, Ltd., Bellevue, Wash.

Filed Nov. 15, 1982, Ser. No. 441,869
Int. Cl.³ F41C *1/02*
U.S. Cl. 42—64 **10 Claims**



1. A latch mechanism for a break-top handgun of the revolver type, comprising:

a frame including an integral handle, hammer, firing pin, and trigger operatively attached to the hammer;

a barrel section including a rotatable ammunitionholding cylinder pivotally attached to the frame for movement between a first position for firing of the gun and a second position exposing the rear end of the cylinder for loading ammunition, unloading ammunition and cleaning of the cylinder or gun barrel;

an upwardly inclined planar surface extending rearwardly from the entrance end of the barrel section;

a latch assembly pivotally mounted to the frame for movement between a first position holding the frame and barrel section in fixed position relative to one another when the gun is to be fired and a second position where the barrel is broken away from the frame, the latch assembly including a pivotable latch member having a separately rotatable planar surface positioned for engaging the upwardly inclined planar surface on the barrel section when in the first position to prevent separation of the barrel section from the frame during firing and to compensate for wear of the upwardly inclined planar surface or the latch assembly caused by repeated opening and closing of the barrel section relative to the frame of the gun; and

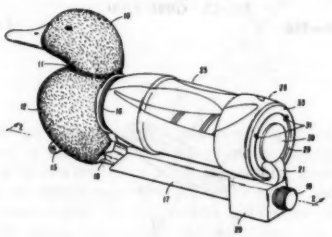
means biasing the latch member forwardly to engage the separately rotatable planar surface against the upwardly inclined planar surface.

4,539,772

ADAPTERS FOR CONVERTING CERTAIN PLASTIC BOTTLES INTO DECOYS FOR DUCK HUNTERS

David R. Forbes, and Carman S. Forbes, Hiawatha, Iowa, assignors to Hunter's Specialties, Inc., Cedar Rapids, Iowa

Filed Jul. 12, 1984, Ser. No. 630,096
Int. Cl.³ A01M *31/06*
U.S. Cl. 43—3 **5 Claims**

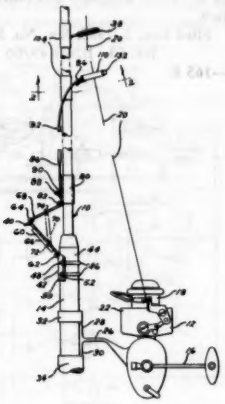


1. For use with a closed, empty bottle of approximately two liter capacity having a cylindrical side wall, a neck portion at one axial end and a bottom portion at the other axial end, an adapter to form with the bottle a floatable decoy for duck hunters, the adapter in its operative position comprising: an upright molded duck portion simulating the head, neck and upper breast portions of a duck, the breast portion having upper and lower front portions and upper and lower rear portions; a molded, hollow keel portion extending longitudinally rearward from the breast lower rear portion and defining a longitudinally extending closed compartment, the keel portion having an upper longitudinal surface portion forming an interior angle with the breast upper rear portion effective to underlie the cylindrical side wall of the bottle when positioned thereon with its axis disposed longitudinally of the keel portion, the keel portion having a closable access opening into the interior thereof for filling the same with weighting means for the decoy; an opening in the breast upper rear portion to receive and locate the neck portion of the bottle when positioned as aforesaid; and means carried by the keel portion to retain the remainder of the bottle in position as aforesaid.

4,539,773
FISHING LINE CHOKE FOR THE ROD OF A SPINNING REEL

Vernon F. Eldridge, 465 Chicopee Ave., Louisville, Ky. 40209

Filed Aug. 2, 1984, Ser. No. 636,952
Int. Cl.[3] A01K 97/00
U.S. Cl. 43—25 6 Claims



1. A thumb operated fishing line choke accessory for use with a rod having an open-face spinning reel supported adjacent a handle of the rod, said accessory comprising:

a. a first clamping member adapted to be fastened adjacent the front end of the rod handle;

b. a thumb-engaging actuator member pivotally mounted to the said clamping member,

c. a movable collar adapted to be carried by the rod and acted upon by the said actuator as well as serving as an anchor means for one end of a compression strut means that is supported along the length of the rod and guided to move generally parallel thereto,

d. and a combined fishing line ring guide and choke arrangement adapted to be fastened intermediate the length of the rod, said guide and choke arrangement comprising an inclined guide frame supporting a smooth ring guide through which a fishing line extends and a movable choke member that is attached to the other end of the said compression strut means and is movable thereby, the guide frame including a resilient stop against which the said fishing line is adapted to be forced by the said choke member when the said actuator member is operated by the user;

e. and retractable spring means acting upon the said actuator member to reset the actuator member when it is released by the user.

4,539,774
RODENT EXTERMINATOR

Lyman L. Hamilton, Burney, Calif., assignor to Alice Hamilton Guest, Kenwood; Robert Lyman Hamilton, Burney and Neil Wesley Hamilton, Rohnert Park, all of, Calif.

Filed Mar. 30, 1984, Ser. No. 595,426
Int. Cl.[3] A01M 27/00
U.S. Cl. 43—80 4 Claims

1. A rodent exterminator, comprising:

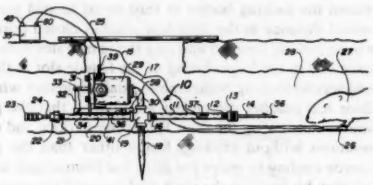
a hollow barrel having:

receptacle means at one end wherein an explosive cartridge is placed;

bearing means having a hole therein at the end opposite said receptacle means, and

holes in the periphery of said hollow barrel located nearer to said bearing means than to said recepotacle means;

plunger means positioned inside said hollow barrel and slidable therein between said receptacle means and said bearing means;



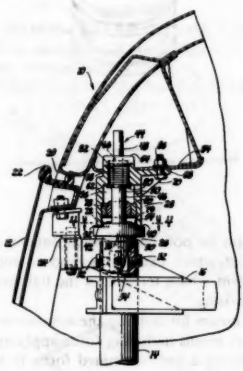
a spear attached to said plunger means and extending through said hole in said bearing means whereby a rodent is impaled by said spear when said cartridge is detonated, and

detonating means for detonating said cartridge including firing pin means and trigger means activated by the presence of a rodent in close proximity to said spear.

4,539,775
LOCKING MECHANISM FOR VEHICLE DOOR

Andrew M. Madonio, Holly, and Michael H. Gulick, Pontiac, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 6, 1984, Ser. No. 597,608
Int. Cl.[3] E05F 7/02
U.S. Cl. 49—255 2 Claims



1. An improved locking mechanism for use in combination with a vehicle door or the like of the type having a door leaf joined to an axial shaft rotatably attached to the vehicle and rotatably driven at the lower end thereof by a power source to swing the door leaf between open and closed positions, said power source moving the shaft axially upwardly a predetermined distance as the door leaf reaches closed position, comprising,

a first locking body rigidly attached to the vehicle or to the upper end of the shaft and including thereon at least one axially directed male locking member having an axial length slightly less than said predetermined distance,

a second locking body rigidly attached to the other of the vehicle or the upper end of the shaft and including thereon at least one axially directed female slot sized slightly larger than the male locking member and oriented relative

to the male locking member so as to be axially opposed thereto as the door leaf reaches closed position,

bearing means rotatably interconnecting the locking bodies together to allow relative rotation therebetween coaxially with the shaft axis as the door leaf opens and closes, said bearing means allowing a relative axial movement between the locking bodies at least equal to said predetermined distance as the door leaf reaches closed position,

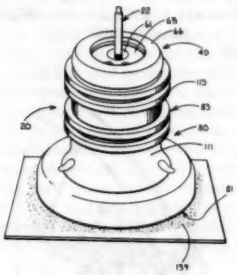
the male locking member entering the female slot with clearance due to the larger sizing of the female slot as the first and second locking bodies move axially together when the door leaf reaches the closed position, so that the power source may swing the door leaf between open and closed positions without binding, forces other than the power source tending to move the door leaf from closed to open position by rotating the shaft slightly until the male locking member and the female slot are brought into engagement, thereby preventing opening of the door leaf by the other force.

4,539,776

METHODS OF AND APPARATUS FOR POLISHING AN END PORTION OF A TERMINATED LIGHTGUIDE FIBER

Frederick R. Weaver, Jr., Snellville, Ga., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Sep. 30, 1983, Ser. No. 538,064
Int. Cl.³ B24B *25/00, 1/00*
U.S. Cl. 51—156 **20 Claims**



6. An apparatus for polishing an encapsulated end portion of a lightguide fiber which extends beyond an end surface of a connector element which terminates the lightguide fiber, said apparatus comprising:

first support means for holding the connector element, said first support means including force-applying means capable of applying a predetermined force to the connector element in a direction toward the encapsulated end portion of the fiber;

second support means including a reference plane for holding securely said first support means and responsive to the application of the predetermined force for supporting said connector element along a peripheral boundary thereof with the peripheral boundary being a predetermined distance from the reference plane and the encapsulated end portion of the fiber extending beyond the reference plane, said second support means including substantially nonwearing means, which are disposed in the reference plane, and being effective when said first support means is held securely therein with the peripheral boundary being supported for causing said force-applying means to apply the predetermined force to the connector element; and

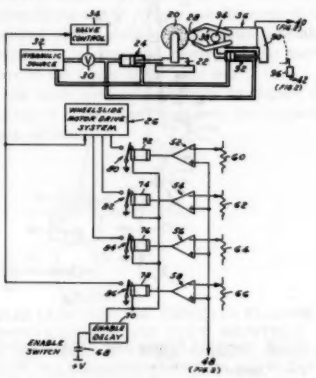
abrading means for polishing the encapsulated end portion of the lightguide fiber which extends beyond the reference plane to cause an end surface of the encapsulated end portion to become spaced the predetermined distance from the peripheral boundary.

4,539,777

MACHINING IN-PROCESS GAGE CALIBRATION FROM REFERENCE MASTER

Bernard J. Brown, Ann Arbor, and Thomas B. Peelle, South Lyon, both of Mich., assignors to Control Gaging, Inc., Ann Arbor, Mich.

Filed Dec. 2, 1983, Ser. No. 557,523
Int. Cl.³ B24B *49/06*
U.S. Cl. 51—165 R **18 Claims**



1. A system for controlling operation of a machine tool for removing stock from a workpiece comprising

gage means including a measurement gage and means for positioning said gage in engagement with a workpiece during machining thereof so as to provide a workpiece measurement signal as a function of dimensions of the workpiece,

means for varying engagement of the machine tool with the workpiece, including means for controlling such engagement in real time as a function of a control signal,

gage master means including a gage master having a predetermined fixed dimension relative to desired machined dimensions of the workpiece and means for positioning said gage in engagement with said gage master so as to provide a gage master measurement signal as a function of dimensions of said gage master, and

compensation means comprising first circuit means for generating and storing a compensation signal as a function of a difference between said gage master measurement signal and said predetermined fixed dimension of said gage when said gage is engaged with said gage master, and second circuit means for providing said control signal to said controlling means when said gage is engaged with a workpiece as a combined function of said workpiece measurement signal and said compensation signal.

4,539,778

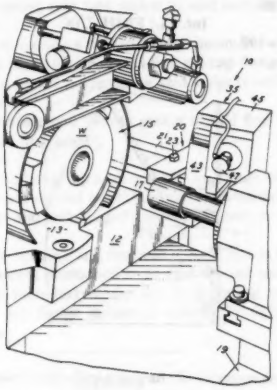
AUTOMATIC DUAL COMPENSATION GRINDING WHEEL CONDITIONER

Victor F. Dzewaltowski, Springfield, and Richard H. Gile, North Clarendon, both of Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation of Ser. No. 418,103, Sep. 14, 1982, abandoned. This application Dec. 17, 1984, Ser. No. 682,632
Int. Cl.³ B24B *49/18, 53/06*
U.S. Cl. 51—165.87 **3 Claims**

1. A method of dual compensation for wear control and conditioning of the wear surface of a super-abrasive wheel

having a super-abrasive constituent and a bonding material constituent such wheel being mounted on a drive spindle and relatively moveable to be engageable with a consumable reconditioning tool comprising: fine truing the wheel by adjusting the position of the wheel in addition to normal feed movements between the wheel and the workpiece during a select number of workpiece grinding steps to compensate for incremental wear of the wheel to maintain apparent wheel wear within the tolerance range of the workpiece being ground; terminating such fine truing at a predetermined depth of wheel



wear produced by such wheel grinding steps; and thereafter relatively positioning the wheel while on its drive spindle with respect to a consumable non-metallic reconditioning tool to cause the tool to be consumed by the wheel to a depth an order of magnitude greater than the predetermined depth of wheel wear so as to remove said bonding material so that individual grains of the super-abrasive constituent of the wheel will extend beyond the bonding material constituent of the wheel to re-establish cutting efficiency of the wheel following the select number of wheel grinding steps.

4,539,779

METHOD OF COMPENSATING FOR DRESSING TOOL WEAR DURING THE DRESSING OF GRINDING WHEELS

Meinrad Donner, Nuolen, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zürich, Switzerland

Filed Mar. 7, 1983, Ser. No. 472,652

Claims priority, application Switzerland, Mar. 19, 1982, 1706/82

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—325 **4 Claims**

1. A method for compensating for wear of an adjustable dressing tool containing a dressing tool tip for dressing a working face of an adjustable grinding wheel, comprising the steps of:

(a) defining a predetermined plane;

(b) positioning said grinding wheel with said working face essentially extending in said predetermined plane;

(c) positioning said tip of said dressing tool in an end position displaced from said working face but within said predetermined plane;

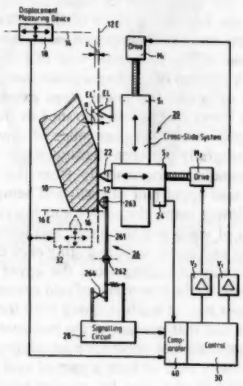
(d) adjustably advancing said dressing tool by a desired dressing amount;

(e) dressing said working face of said grinding wheel;

(f) adjusting the position of said grinding wheel in order to position said working face thereof in said predetermined plane;

(g) measuring the amount of the adjustment of said grinding wheel needed in order to position said working face thereof in said predetermined plane;

(h) comparing the measured amount of said adjustment of said grinding wheel undertaken in step (g) with said desired dressing amount of step (d) and thereby determining



a difference between the grinding wheel adjustment of step (f) and the desired dressing amount of step (d); and

(i) immediately after step (h) repeating steps (b) to (h) but with an adjustable advance of the dressing tool during step (d) wherein the desired dressing amount is increased by the difference determined during step (h).

4,539,780

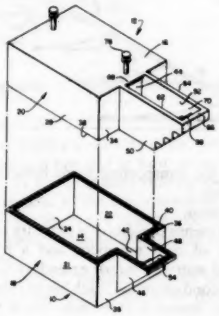
STORM CELLAR OR THE LIKE

William C. Rice, Arlington, Tex., assignor to Dalworth Construction Inc., Arlington, Tex.

Filed Nov. 29, 1983, Ser. No. 555,967

Int. Cl.³ E04H *7/00*

U.S. Cl. 52—169.6 **10 Claims**



1. A storm cellar or the like comprising a pair of separately pre-cast concrete upper and lower sections each section having a horizontal wall and an upstanding wall around the perimeter of the horizontal wall and having an outer free edge terminating in a horizontal plane spaced from the horizontal wall, the upper section being inverted in relation to the lower section, the free edges of each of said upstanding walls having like perimeters with the free edge of the inverted upstanding wall of the upper section being seated on the free edge of the upstanding wall of the lower section, said upstanding walls having aligned openings therein extending through the free edges of the respective walls to define an entrance into said storm

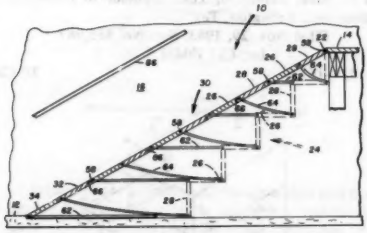
cellar, pairs of upper and lower laterally spaced walls, each pair being cast integrally with the respective upper and lower sections and bracketing the respective openings, said pairs of walls extending outwardly away from the upstanding walls of said sections, the lower pair of walls having upper edges terminating in the horizontal plane of the upstanding wall of the lower section, the upper pair of walls having lower edges terminating in the horizontal plane of the upstanding wall of the upper section, and having upper edges terminating substantially in the plane of the horizontal wall of the upper section, lower steps of a portion of a stairway cast integrally between the lower pair of walls, the lower steps extending progressively from the lower end of said entrance to the upper edges of said lower pair of walls, upper steps of a portion of said stairway cast integrally between the upper pair of walls, said upper steps extending progressively from the lower to the upper edges of said upper pair of walls and being complementary with said lower steps, the upper and lower edges of the respective pairs of walls and the upper and lower ends of the respective lower and upper steps engaging each other to define a complete stairway extending from the upper edges of the upper pair of walls to the lower end of said entrance, the upper edges of the upper pair of walls defining with the upper end of said upper steps and that portion of the horizontal wall of the upper section between said upper pair of walls a substantially horizontal hatchway over at least a part of said stairway, and a displaceable hatch of a size for closing said substantially horizontal opening.

4,539,781

DEVICE FOR TRANSPORTING LOADS BETWEEN VARIOUS ELEVATIONS

Leon A. McCoy, 1817 N. Chester St., Baltimore, Md. 21213

Filed Oct. 4, 1983, Ser. No. 539,000
Int. Cl.³ E04F *11/00*
U.S. Cl. 52—183 **11 Claims**



1. A device for transporting loads between various elevations, comprising:

a stairway means;

said stairway means consists of a plurality of tread members, a plurality of riser members, and a plurality of hinge means, said stairway means extending from a first elevation to a second elevation, each hinge means of said plurality of hinge means in turn transversely hingedly affixing one of said tread members to one of said riser members, said transverse hinged affixation being provided alternately between the juncture of the lowermost transverse edge of each said riser member and the rearmost transverse edge of the adjacent said tread member, and between the juncture of the forwardmost transverse edge of each said tread member and the uppermost transverse edge of each said riser member, and between the uppermost transverse edge of the topmost riser member of said stairway means and said second elevation, the lowermost distal end of said stairway means being suitably affixed at said first elevation, and

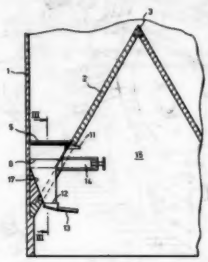
a mechanism means, said mechanism means being capable of converting said stairway means into a ramp means, said ramp means having a ramp-like configuration.

4,539,782

SILO FOR LOOSE MATERIAL IN POWDER FORM

Norbert Ahrens, Oelde; Otto Heinemann, Ennigerloh; Heinrich Klockenbusch, Ahlen, and Wolfgang Kluger, Beckum, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Apr. 12, 1984, Ser. No. 599,652
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314329
Int. Cl.³ E04H *7/00*
U.S. Cl. 52—192 **14 Claims**



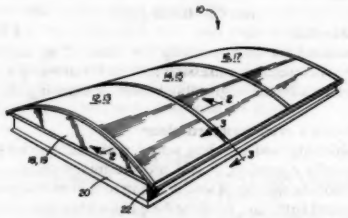
1. In a loose material silo having a cylindrical wall and a base the central region of which is formed by an upwardly projecting conical section, said base having a number of material discharge openings distributed symmetrically over its periphery between said conical section and said wall, said base having zones between the material discharge openings provided with loose material-supporting inclined surfaces, the improvement wherein said inclined surfaces are inclined peripherally of the silo and toward the material discharge openings in such manner that loose material may flow approximately tangentially of said zones of said base towards the respective material discharge openings.

4,539,783

BARRELL VAULT SKYLIGHT SYSTEM

William F. O'Keeffe, and Sonny Q. Garcia, both of San Francisco, Calif., assignors to O'Keeffe's, Inc., San Francisco, Calif.

Filed Sep. 12, 1983, Ser. No. 530,950
Int. Cl.³ E04B *7/18*
U.S. Cl. 52—200 **31 Claims**



1. A skylight system comprising:

a sill adapted to be fastened to a structure; at least one support rafter;

means for interconnecting the support rafter and the sill;

a first sill cap which is substantially U-shaped;

first means for interconnecting the first sill cap with the sill,

which interconnecting means includes a first channel extending from said sill and a portion of said first sill cap which is lockingly inserted into said first channel;

a second sill cap which is substantially U-shaped;

second means for interconnecting the second sill cap with the sill, with the second sill cap nested about the first sill cap, which second interconnecting means includes a second channel extending from said sill and a portion of said second sill cap which is lockingly inserted into said second channel;

a first gasket;

means for mounting said first gasket to said support rafter;

a first panel;

said first sill cap having a first sill flange means for positioning said first panel between said first sill cap flange means and said first gasket mounted on said support rafter;

a second gasket;

means for mounting said second gasket to said first panel in line with said first gasket;

a second panel;

said second sill cap having a second sill cap flange means for positioning said second panel between said second sill cap flange means and said second gasket mounted on said first panel;

strap means for holding said first and second panels in place, said strap means positioned over said second panel, said strap means including means for cooperating with said second sill cap flange means to selectively tighten said strap means.

4,539,784

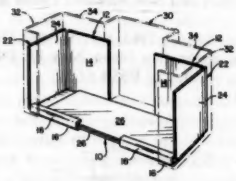
ADJUSTABLE DOOR JAMB ANCHOR

Ernest R. Allen, 1131 Vine St., Jonesboro, Ark. 72401

Continuation-in-part of Ser. No. 547,137, Oct. 31, 1983, which is a continuation-in-part of Ser. No. 418,429, Sep. 15, 1982, Pat. No. 4,478,016. This application Feb. 15, 1984, Ser. No. 580,348

Int. Cl.³ E06B *1/04*

U.S. Cl. 52—217 **11 Claims**



1. An adjustable jamb anchor for use in the installation of a door jamb, comprising:

at least one frame member formed in an L-shaped configuration with horizontal and vertical planar portions, said horizontal portion of the frame member having a lip formed in the other edge thereof so as to provide a slot; and a pair of L-shaped overlapping members supported by said frame member, each overlapping member having horizontal and vertical planar portions, said overlapping members having the horizontal portions thereof retained in overlapping relation within said slot and between the vertical portion of said frame member and said slot.

4,539,785

CAPTIVE COLUMN

Gordon I. Overbo, 302 16th Ave. South, Devils Lake, N. Dak. 58301

Filed Aug. 3, 1983, Ser. No. 519,980

Int. Cl.³ E04H *12/16, 12/12;* E04C *8/10*

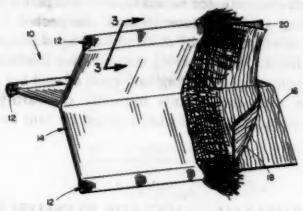
U.S. Cl. 52—309.1 **5 Claims**

1. A captive column structure comprising,

a plurality of spaced-apart elongated column portions,

a compression core interconnecting with said column portions,

said compression core and said column portion being



substantially comprised of bonded fibrous material, the fibrous material of said column portions and compression core being integrally bonded by resin into a unitary structure.

4,539,786

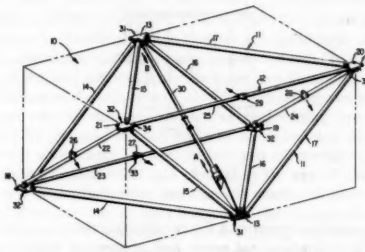
BIAXIAL SCISSORS FOLD, POST TENSIONED STRUCTURE

Roy A. Nelson, Grand Prairie, Tex., assignor to LTV Aerospace and Defense Co., Dallas, Tex.

Filed Mar. 3, 1983, Ser. No. 471,578

Int. Cl.³ E04H *12/18*

U.S. Cl. 52—645 **10 Claims**



1. A structure capable of being expanded and retracted comprising:

(a) a pair of cells;

(b) said cells each including a plurality of leg elements which are pivotally joined at one end to form an apex point and which are pivotally joined at their ends opposite from the apex point connection, to the corresponding leg element from said other cell to form a plurality of common base points, said leg elements comprising means for sustaining compressive loads;

(c) a plurality of tensional, hinged, elements connected between adjacent common base points to thereby form a common base;

(d) said hinged elements each having a pair of sections that are connected at a hinge point approximately midway between said adjacent common base points to which said other end of each section is connected, said hinged elements comprising means for forming a linear configuration sustaining tensional loads and for folding into a compacted configuration upon the application of compressive loads;

(e) an actuator means having its ends pivotally attached to said apex points; and

(f) biasing means associated with said actuator means for biasing said apex points, to which said actuator means is attached, towards and away from each other whereby said

leg elements pivot about said apex points and said base points, said sections of said hinged elements pivot about said base points and said hinge points to thereby expand or retract said structure, respectively;

(g) wherein said actuator means further comprises means for expanding said structure from a compacted to an expanded configuration by drawing said apex points toward each other and for applying compressive loads upon said leg elements for displaying said ends of said leg elements opposite said apex points mutually outwardly against constraining, tensional forces exerted by said hinged elements.

4,539,787

REINFORCEMENT MAT FOR REINFORCED CONCRETE

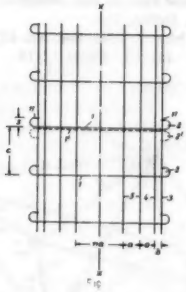
Gerhard Ritter, and Klaus Ritter, both of Graz, Austria, assignors to AVI Alpenländische Veredelungs-Industrie Gesellschaft m.b.H., Graz, Austria

Filed Nov. 16, 1982, Ser. No. 442,149

Claims priority, application Austria, Nov. 20, 1981, 5003/81; Feb. 17, 1982, 608/82

Int. Cl.³ E04C *2/42*

U.S. Cl. 52—664 **15 Claims**



1. In a reinforcement mat for reinforced concrete, said mat consisting of longitudinal wires and crosswires which cross one another and are welded together at the points of cross and have their bonding improved by ribbing or stamping, the improvement wherein end portions of said crosswires project beyond edge ones of said longitudinal wires and said projecting end portions of said crosswires are bent back in the plane of said mat in the direction towards said edge longitudinal wires; and wherein said longitudinal wires are arranged symmetrically about a longitudinal centreline of said mat partly at wider and partly at narrower pitch, and at each edge of said mat a family of at least two of said longitudinal wires arrangjed at narrow pitch is provided.

4,539,788

METHOD OF BUILDING A HOUSE STARTING FROM A PACKAGED STRUCTURE, A PACKAGED STRUCTURE FOR USE IN SAID METHOD, A METHOD OF MAKING A FOUNDATION, AND A PILE CAP FOR USE THEREIN

Johannes Buijs, Krimpen a/d Ijssel, Netherlands, assignor to Adviesbureau D3BN Civiel Ingenieurs, Amsterdam, Netherlands

Filed May 3, 1983, Ser. No. 491,060

Claims priority, application Netherlands, May 13, 1982, 8201996

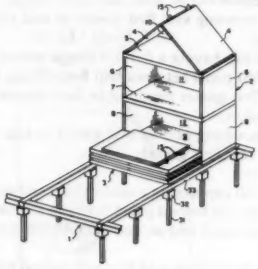
Int. Cl.³ E04B *1/346*

U.S. Cl. 52—745 **6 Claims**

1. A method of building a house or the like on a previously provided foundation starting from a folded and stacked packaged structure including a plurality of panels including roof panels for forming a roof storey on said house, comprising:

permanently attaching at least some of said panels, including said roof panels, to one another with hinge means; depositing said package on said foundation;

moving said roof panels, which are situated at the top of the package, upwards, and securing said roof panels by means of coupling members at their edges opposite said hinge means to a roof-storey foor;



unfolding a roof storey outer wall member, which in the packaged form is intermediate the roof panels and the roof-storey floor; and

successively hoisting up from superjacent to subjacent the remaining panels of said package such that said hingedly attached panels are unfolded into proper position and can be readily attached to the next subjacent portion of said package.

4,539,789

BUNDLING APPARATUS

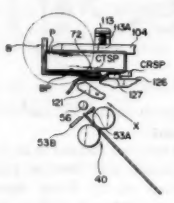
Toshiyuki Miyano, Yokohama, and Hideo Ohmura, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 10, 1983, Ser. No. 493,276

Claims priority, application Japan, May 13, 1982, 57-80968

Int. Cl.³ B65B *61/00*

U.S. Cl. 53—131 **9 Claims**



1. A bundling apparatus which comprises:

first clamping means for pressing a stack of objects in the direction of thickness of the stack and holding the stack;

band-winding means for winding a band around the stack of objects held by the first clamping means;

bonding means for bonding end portions of the band to each other, said end portions being positioned on one side of said stack; and

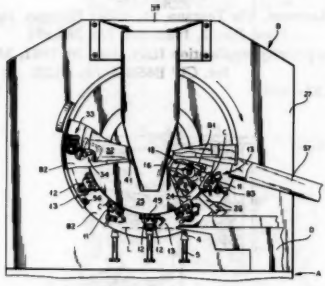
data-stamping means for stamping specified data on the band wound around the stack, said data-stamping means including (a) a stamp bearing the specified data, and (b) first drive means for bringing the stamp into contact with a portion of the band positioned on another side of said stack opposite to said one side while the end portions of the band are being bonded to each other by said bonding means.

4,539,790

APPARATUS FOR THE CONTINUOUS WRAPPING OF SWEETS OR LIKE PRODUCTS IN A SO-CALLED DOUBLE TWIST WRAPPER

Alderino Zamboni, Budrio, Italy, assignor to Risvin - Ricerche e Sviluppo Industriale S.r.l., Budrio, Italy

Filed Aug. 10, 1983, Ser. No. 522,185
Claims priority, application Italy, Aug. 18, 1982, 3511 A/82
Int. Cl.[3] B65B *11/34*
U.S. Cl. 53—227 4 Claims



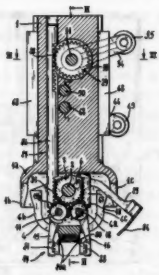
1. Apparatus for the continuous wrapping of sweets or like products or articles in a so-called double twist wrapper shape, characterised in that it comprises a supply device for supplying with a continuous movement a sequence of equally spaced sweets along at least one horizontal rectilinear path section, a rotary wheel moving continuously about a horizontal axis supporting in an equally spaced arrangement in a radially slideable manner a plurality of handling devices having heads oscillating about an axis parallel to the said horizontal axis of rotation of the rotary wheel and supporting gripper take-up member means which may be moved for opening and closing in the plane of rotation of the said rotary wheel having a horizontal axis and hoe-shaped folding means, the said rotary wheel having a horizontal axis being supported such that the said gripper take-up member means and the said hoe-shaped folding elements are disposed in succession above and along the said horizontal rectilinear supply section for the sweets, two wheels each supporting a corresponding respective plurality of twisting devices having gripper take-up members, which wheels are rotatably mounted and move continuously with and at the opposite sides of the above-mentioned rotary wheel supporting the handling devices with the gripper take-up member means of the twisting devices in mirror symmetry and facing away from the opposite sides of the gripper take-up member means of these handling devices, means for transmitting movement for the synchronous actuation of the said supply device and the rotary wheels having a horizontal axis at least along the horizontal rectilinear section, cam means for the radial actuation of the handling devices and for causing the oscillation of the oscillating head in order to orientate the respective gripper take-up memebr means parallel and perpendicular to, at the level of and along the rectilinear horizontal section, and cam means for actuating the the gripper take-up member means of the handling devices and twisting devices for closure along the horizontal, rectilinear section and at the end thereof respectively, as well as for actuating the hoe-shaped folding elements.

4,539,791

CONTINUOUSLY MOVING HANDLING DEVICE FOR PACKING MACHINES IN PARTICULAR FOR SWEETS AND SIMILAR PRODUCTS

Alderino Zamboni, Budrio, Italy, assignor to Risvin - Ricerche E Sviluppo Industriale S.r.l, Bologna, Italy

Filed Aug. 10, 1983, Ser. No. 522,183
Claims priority, application Italy, Aug. 18, 1982, 3510 A/82
Int. Cl.[3] B65B *11/34*
U.S. Cl. 53—234 2 Claims



1. A handling device for packing machines, in particular for sweets and like products of the type comprising one or more continuously moving rotary wheels, characterised in that it comprises a support body having an elongate polygonal prismatic shape which may be associated in predetermined numbers at a uniform spacing with the said wheel(s) moving continuously in a radially slideable manner, a headed body mounted in an articulated manner to oscillate at the radially outermost end of the said support body about an axis parallel to the axis of rotation of the said rotary wheel(s), operating means having gripper take up elements and hoe-shaped folding devices supported by the said headed body in an articulated manner to oscillate about axes parallel to the axis of oscillation of the oscillating headed body and parallel to the axis of rotation of the said rotary wheel(s), and control means for moving in a radial direction the support body with the associated oscillating headed body supporting the oscillating operating means with gripper take up elements and hoe-shaped folding devices and for causing the oscillation of the oscillating headed body and independently the oscillation of the oscillating operating means having gripper take up elements and hoe-shaped folding devices in order to cause these latter means to perform a movement of constant orientation along and relative to a path for continuous conveyor movement having a mixed course with sections which are rectilinear, spiral, circular, and curved in any way which follow one another in an intercalated manner and at different speeds in accordance with the type of operation to be carried out on the product thereby cancelling out completely any relative speed with respect to the latter irrespective of its conveyor speed type.

4,539,792

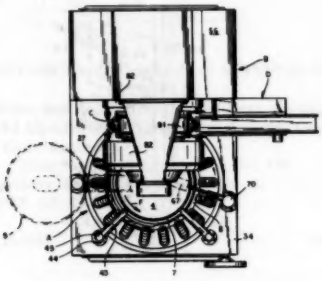
APPARATUS FOR SEQUENTIAL SUPPLY OF SWEETS OR LIKE ARTICLES TO CONTINUOUSLY MOVING PACKING APPARATUS OR MACHINES

Alderino Zamboni, Budrio, Italy, assignor to Risvin - Ricerche E Sviluppo Industriale S.r.l., Budrio, Italy

Filed Aug. 10, 1983, Ser. No. 522,184
Claims priority, application Italy, Aug. 18, 1982, 3512 A/82
Int. Cl.[3] B65B *77/34*
U.S. Cl. 53—234 6 Claims

1. Apparatus for the sequential supply of sweets or like products to a continuously moving wrapping apparatus or machine of the type designed to convey the sweets to be wrapped along a wrapping path or line having a mixed course

and comprising at least one rectilinear horizontal section, the said apparatus being of the type having a superimposed wheel construction, which wheels rotate coaxially with a continuous movement about a vertical axis, and include a first upper plate wheel designed to receive products in bulk and to supply them in single file via a duct having a spiral course to the periphery of a second lower disc wheel, characterised in that the said second wheel is provided peripherally with a plurality or peripherally open equally spaced apertures and that below each of these apertures there are provided take-up member



means associated with a third lower wheel in a radially slidable manner so that they may be orientated about a respective vertical axis in order to receive individual products and convey them from the peripheral path of the said second and third wheels along a rectilinear horizontal path section parallel to and below the said rectilinear horizontal path section of the wrapping line of the wrapping machine with a constant orientation with respect to the rectilinear horizontal path sections in order to supply them to the continuously moving wrapping apparatus or machine.

4,539,793

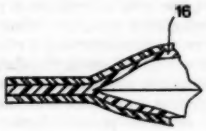
METHOD OF FORMING A BURSTABLE POUCH

Edward J. Malek, Union Grove, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 488,287, Apr. 25, 1984, abandoned. This application Mar. 5, 1984, Ser. No. 586,452

Int. Cl.³ B65B *1/04*

U.S. Cl. 53—469 **7 Claims**



1. A method for forming a closed burstable pouch having a breakable seal at a first edge comprising:

selecting laminated polymeric film having an outer layer of material responsive to a radio-frequency welding field and an inner layer of material substantially non-responsive to a radio-frequency welding field, said outer layer material having a higher melting point than the inner layer material, and said inner layer having cohesive strength in its thickness direction less than the cohesive strength of the outer layer to aid in controlled bursting of the pouch;

placing two sheets of said film in overlying relationship with their inner layers in contact and their edges aligned;

permanently fusing together said sheets along their aligned edges, except along said first edge;

either before or after said fusing step, sealing said first edge by sandwiching the sheets along said first edge between radio-frequency welding electrodes and applying a radio-frequency field therebetween for a time and at an intensity to heat said outer layers sufficiently to fuse said inner layers by heat transfer from said outer layers without melting said outer layers and without destroying the relative weakness of the inner layer material in its thickness direction; and

before completing the last of said fusing and sealing steps, filling said pouch.

4,539,794

AUTOMATIC MACHINE FOR UNLOADING AND RELOADING FILMS FROM AND INTO X RAY CASSETTES

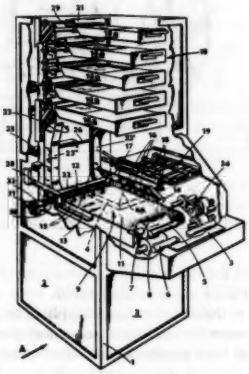
Cesare Azzaroni, Via Toscana, 51, 40141 Bologna, Italy

Filed Jun. 1, 1982, Ser. No. 383,694

Claims priority, application Italy, Jun. 26, 1981, 3468 A/81

Int. Cl.³ B65B *5/10*

U.S. Cl. 53—493 **12 Claims**



1. In an automatic machine for unloading and reloading films from and into X ray cassettes, comprising, at an operating station, means for inserting the cassettes, one at a time, into the inside of the machine, for conveying the cassettes within the machine, and for ejecting the reloaded cassettes from the machine, an abutment element placed at the side of the means of conveyance of the cassettes, at least one pusher device movable, in a substantially horizontal plane, perpendicularly to the forward movement direction of the cassettes in such a way as to come into lateral contact therewith and able to carry them to rest up against said abutment element a magazine for new films of various formats, placed above said operating station and including a plurality of drawers arranged at different levels, one above the other, each suitable for containing a pack of films of one particular format and the contents of each being different, first and second detector means, the former tripped by said pusher and the latter by the thrusting of the cassette against said abutment element, withdrawal means, positioned in the region of said magazine, for withdrawing from said drawers a film to suit the format of the cassette inserted in the machine, as ascertained by said first and second detector means, and transfer means placed in the region of the said operating station in order to transfer said film withdrawn from the magazine into the cassette at said operating station,

the improvement comprising a hopper for guiding the films which, when withdrawn from said magazine, drop down freely towards the X ray cassette, said hopper comprising two elements for guiding each individual film, placed one opposite the other and defining two channels for the containment and the sliding motion of the edges of two opposite sides of the films, a first element being fixed and

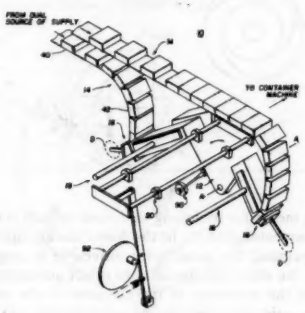
positioned on the same side of the machine as the abutment element, and the second supported in a sliding fashion by the machine in a way whereby it is able to undergo, in the direction of the fixed guide element, a two way displacement, connected rigidly to said pusher device so as to be movable therewith in the direction of the first guide element.

4,539,795

ORIENTATION, ACCUMULATION AND POSITIONING MACHINE

Donald R. Wilkinson, Clemmons, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jul. 26, 1983, Ser. No. 517,199
Int. Cl.³ B65B *35/40, 35/54*
U.S. Cl. 53—542 **15 Claims**



1. A machine for orienting, accumulating and positioning packages received from two sources for loading into containers, comprising:

oscillating means including an oscillating member which oscillates between the two sources, and in the process both receives packages from one source while participating in loading packages into a container from the other source;

orienting means associated with each source which receive packages from its associated source and rotates each package to rest on a common one of its sides;

accumulating means associated with each orienting means for collecting the packages rotated by the orienting means into a group of a predetermined number;

positioning means associated with each orienting means and accumulating means for positioning the grouped packages onto the oscillating member; and

loading means for advancing the positioned group of packages from the oscillating member into a container.

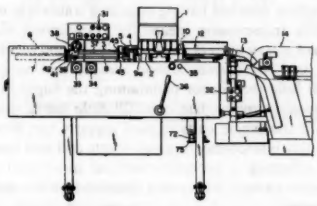
4,539,796

APPARATUS FOR MANUFACTURING SAUSAGES OR THE LIKE

Minoru Nakamura, Tokyo, and Minoru Kasai, Ebina, both of Japan, assignors to Hitec Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,408
Int. Cl.³ B65B *43/48*
U.S. Cl. 53—576 **1 Claim**

1. An apparatus for manufacturing sausages or the like comprising: a stuffer tube for stuffing dough into a casing; a pump for continuously discharging the dough to supply the dough into the stuffer tube; a casing pusher for propelling the casing; a chuck for receiving the stuffed casing from a discharging end of said stuffer tube, said chuck having means for frictionally engaging a part of said casing; and a linking device coacting with said chuck for twisting the stuffed casing as pushed out of said chuck into a chain of links, first means for manually changing the speed of rotation of said pump independently of said linking device; second means for manually changing the speed of operation of said linking device independently of said first means; third means for propelling said casing selectively automatically or manually; and fourth means for rendering said stuffer tube selectively rotatable or nonrotatable; said pump having a speed reducer in turn having an input shaft and an output shaft; a single motor for driving said pump and said linking device, said motor having an output shaft having oppositely projecting ends; said first means comprising a pump speed change device including a first conical pulley mounted on one of said ends of the output shaft of said motor, a second conical pulley mounted on said pump speed reducer input shaft, and a first endless belt entrained around said first and second conical pulleys; said second means comprising a linking device speed change device including a third conical pulley mounted on the other end of the output shaft of said motor, a fourth conical pulley mounted on an end of a further output shaft for driving said linking device and rotating said stuffer tube, and a second endless belt entrained around said third and fourth pulleys, said pump reducer comprising a pair of intermeshing gears mounted respectively on said pump speed reducer input shaft and output shaft for driving said pump, and therewith for reducing the speed of rotation of said pump after a speed change has been effected by said pump speed change device; and a linking device speed reducer comprising a first



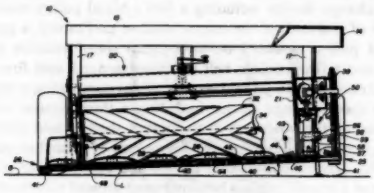
pulley mounted on said further output shaft, a second pulley mounted on a driving shaft for driving the linking device, and third endless belt entrained around said first and second pulleys for reducing the speed of operation of said linking device after a speed change has been effected by said linking device speed change device; said third means comprising a first fluid cylinder having a piston rod, a casing pusher rod connected to said piston rod for being operated thereby, a first manually operable handle connected to said casing pusher rod and guided by a guide bar extending parallel to said stuffer tube, and a semiautomatic control circuit for venting said fluid cylinder to atmosphere to allow said piston rod to be manually movable reciprocally when said casing is selected to be manually propelled; said fourth means comprising a clutch shaft rotatable in response to said further output shaft, a first clutch having an integral pulley and comprising a hollow tubular body rotatable by said clutch shaft, a second clutch mounted on said stuffer tube for meshing engagement with said first clutch to rotate said stuffer tube, and a second manually operable handle for operating third and fourth clutches mounted on said clutch shaft to render said first clutch selectively rotatable or nonrotatable; and a second fluid cylinder having a nonrotatable rod for propelling said stuffer tube, said rod and said stuffer tube being coupled by a bearing which allows said stuffer tube to be rotated and transmits a propulsion force from said nonrotatable rod to said stuffer tube.

4,539,797

METHOD AND APPARATUS FOR CHECKING LUBRICANT VOLUME IN A DISC CUTTERBAR

Kenneth W. McLean, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Mar. 2, 1984, Ser. No. 585,726
Int. Cl.³ A01D *69/12*
U.S. Cl. 56—12.3 **23 Claims**



1. In a harvesting machine having a mobile frame; conditioning means supported by said frame for conditioning crop material fed thereon; a header floatingly supported from said frame for generally vertical movement relative thereto, said header having first and second transversely spaced apart sidewalls; rotary cutting means mounted on said header forwardly of said conditioning means to sever standing crop material, said rotary cutting means including a transverse support bar rotatably mounting a plurality of rotary cutters, said support bar being a generally hollow member having opposing transverse ends and housing drive transmission means for transferring rotational power to said rotary cutters and a supply of fluid lubricant for lubricating said drive transmission means, said support bar having a fill hole therein for maintaining the supply of lubricant within said support bar, said fill hole being positioned between said transverse ends of said support bar; header lift means operably interconnecting said frame and said header for selectively effecting a generally vertical movement of said header relative to said frame; and drive means for delivering rotational power to said drive transmission means, the improvement comprising:

header tilt means for tilting said header at a predetermined angle inclined to horizontal such that one transverse end of said support bar can be positioned higher than the other transverse end to cause the supply of lubricant therein to flow to the lower transverse end, said fill hole being positioned such that the fluid level of said lubricant is at said fill hole when said support bar is positioned at said predetermined angle and when the proper volume of lubricant is present within said support bar.

4,539,798

APPARATUS AND METHOD FOR CONVEYING AND/OR TREATING CROP

Wilfred E. Klinner, Milton Keynes, United Kingdom, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 477,872, Mar. 23, 1983,. This application Jul. 26, 1983, Ser. No. 517,445
Claims priority, application United Kingdom, Mar. 26, 1982, 8209019; Jul. 29, 1982, 8221910; Mar. 11, 1983, 8306762
Int. Cl.³ A01D *89/00*
U.S. Cl. 56—16.4 **9 Claims**

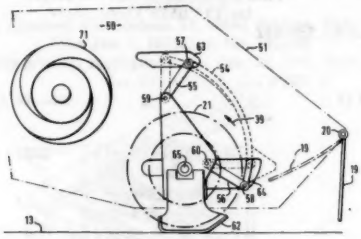
1. Apparatus for picking up and conveying crop comprising:

a mobile frame for movement across the ground;

a conveying rotor mounted for rotation about an axis transverse to the direction of forward movement of the apparatus and substantially parallel to the ground for picking up and conveying crop;

a hood extending around at least part of the front half of the rotor and defining between the hood and part of the outer periphery of the rotor a crop flow passage along which crop is conveyed by the rotor;

drive means for driving the conveying rotor in rotation in a sense such that the rotor picks up crop and conveys the crop upwardly and rearwardly over the rotor, the drive means being arranged to drive the rotor in rotation at a speed such that the rotor accelerates the crop during movement of the crop through the restriction defined between the hood and the periphery of the rotor; such that, at least during acceleration, the periphery of the rotor moves faster than the crop; and such that, after the conveying, the crop is released from the rotor at least predominantly by centrifugal effect; and



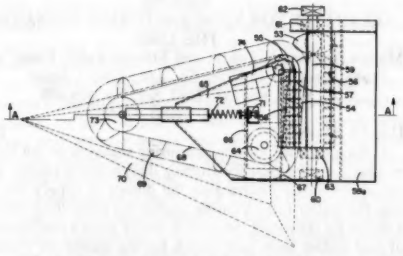
mounting means for mounting said hood on said frame so as to be moveable relative to the frame during operation of the apparatus, the hood being moveable in response to, and by the effect of, the crop to effect automatic adjustment of the clearance at the entrance to the crop flow passage, said mounting means constraining said hood to move along a substantially predetermined path, said hood being mounted in such a manner that an increase in crop load produces circumferential movement of the hood in the direction of crop flow along a curved path spaced from and lying around the outer periphery of the rotor, and increases both the vertical clearance between the front of the hood and the ground and the horizontal clearance between the front of the hood and the rotor at the entrance to the crop flow passage.

4,539,799

METHOD AND APPARATUS FOR HARVESTING CORN OR OTHER CEREALS

Klemens Kalverkamp, Warendorfer Str. 265, D-4730 Ahlen/-Westf., Fed. Rep. of Germany

Filed Oct. 6, 1983, Ser. No. 539,653
Int. Cl.³ A01D *45/02*
U.S. Cl. 56—60 **24 Claims**



1. A method of harvesting grain plants, including corn and other cereals, and each plant including grain connected to a stalk, with a traveling harvester, comprising the steps of:

moving the harvester through a field of the plants while

gathering plants of a row with a vertical orientation of the stalk;

guiding the plants transversely of the vertical orientation and transversely of the direction of movement of the harvester into a plucking gap which includes a fixed plucking edge;

drawing the stalk of a plant downwardly by engaging the stalk on one side with a rotating draw-in drum and forcing the stalk against the plucking edge to pluck the grain by breaking the grain from the stalk; and

chopping the stalk into pieces adjacent the plucking gap while continuing to draw the stalk downwardly.

4,539,800

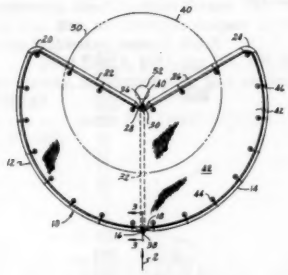
SHRUB RUG

Walter V. Furmaga, 35268 Bennett, Livonia, Mich. 48152

Filed Nov. 26, 1982, Ser. No. 444,806

Int. Cl.³ A01D *46/22*

U.S. Cl. 56—329 **11 Claims**



1. A shrub rug for catching shrub trimmings and removing them from beneath a shrub comprising a substantially completely rigid frame defining only the entire outer periphery thereof all portions of which rigid frame are connected together and which frame is adapted to be inserted beneath a shrub and positioned on the ground, a complete mat having no openings therein which would allow trimmings to fall therethrough provided within the frame secured to the frame around the entire periphery of the mat, said frame being foldable substantially centrally of the frame and mat to provide a substantially shorter maximum shrub rug dimension for storage when not in use and whereby on withdrawal of the unfolded frame and mat secured thereto from beneath a shrub with the shrub rug in use with shrub trimmings thereon the frame and mat may be folded with the mat forming a pouch with the said trimmings therein which pouch is within a rigid frame and within which pouch the trimmings may be transported to a refuge container, wherein the frame and mat extend over substantially 240° of a circle with the fold dividing the frame and mat into approximately 120° circular sections.

4,539,801

RESILIENT FEED AUGER ATTACHMENT

Robert D. Field, P.O. Box 307, Jonesville, La. 71343

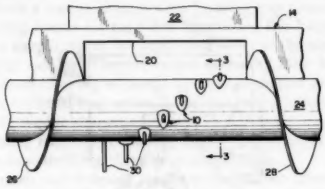
Filed Mar. 30, 1984, Ser. No. 595,325

Int. Cl.³ A01D *89/00*

U.S. Cl. 56—364 **22 Claims**

12. A resilient attachment for a feed auger in a combine header of the type having a cylindrical drum mounted for rotation about a longitudinal axis, spiral flights mounted on opposite longitudinal ends of the drum, and a central drum portion having a plurality of reciprocating feed fingers extending radially therefrom, the attachment comprising:

a body member of resilient material, said body member being sized and shaped for compressing against vegetation in a relatively narrow space formed between said drum and said header, for expanding and pushing against vegetation in a wider space formed between said drum and a combine throat, for providing increased frictional surface areas, for varying the central drum portion to accommodate different sized loads, for protecting and repairing the central



drum portion and for removing vegetation from the feed fingers; an opening extending through said body member for receiving one of the feed fingers; and coupling means for attaching said body member about the central drum portion.

4,539,802

PROCEDURE TO SPLICE YARNS

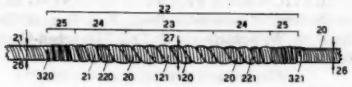
Luciano Bertoli, Salo' ; Roberto Badiali, and Claudio Speranzin, both of Pordenone, all of Italy, assignors to Officine Savio S.p.A., Pordenone, Italy

Filed Mar. 23, 1984, Ser. No. 592,549

Claims priority, application Italy, Mar. 28, 1983, 83358 A/83

Int. Cl.³ B65H *69/06;* **D01H** *15/00*

U.S. Cl. 57—22 **21 Claims**



1. In a method of splicing yarns by coupling two single untwisted yarns together and thereafter reconstituting the twists using a machine having retwister rings, the improvement comprising

untwisting a part of the twisted yarns until twists of a sign opposite to the sign of the original twists have been imparted,

causing the parts with opposite twists in the coupled yarns to be made substantially parallel,

coupling the part with the opposite twist of one yarn with the part with the opposite twist of the other yarn,

applying a substantial axial plucking and/or tearing to the substantially parallel parts to obtain reduced tails of yarns, the taper of the remaining reduced tails reaching the neighborhood of the retwister rings,

controlling the resulting remaining tails and positioning same beside said yarns before action to impart retwisting is begun and

retwisting the coupled part until a desired twist has been imparted.

4,539,803

DEVICE TO PIECE-UP YARN AND DOFF YARN PACKAGES ON OPEN-END SPINNING MACHINES

Francesco Ferro, Pordenone, and Giosuè Franci, Azzano Decimo, both of Italy, assignors to Officine Savio S.p.A., Pordenone, Italy

Filed Jul. 20, 1983, Ser. No. 515,633

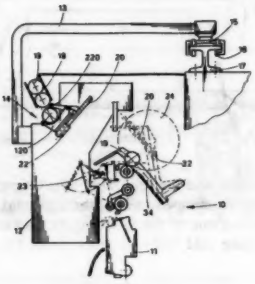
Claims priority, application Italy, Oct. 12, 1982, 83460 A/82

Int. Cl.³ D01H *15/00, 9/10*

U.S. Cl. 57—263 **6 Claims**

1. An improved device to piece-up yarn and doff yarn packages on open-end spinning machines, comprising a carriage

(12) equipped with specific means for the tasks of piecing-up yarn and doffing yarn packages and supported cantileverwise by an arm (13) secured to a trolley (15) able to run on lengthwise guide means (17), said carriage (12) being equipped with an arm (20) to hold tubes and which cooperates with a tube



store (18), the arm (20) being provided with means (120) for gripping tubes from said tube store and transporting same to a position alongside a winding roller, said means for gripping tubes enabling the tubes to be rotated when alongside the winding roller.

4,539,804

METHOD AND APPARATUS FOR STARTING THE OPERATION OF A FRICTION SPINNING MACHINE

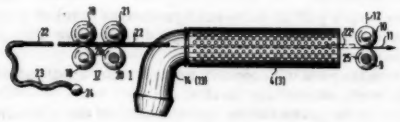
Josef Derichs, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Möenchen-Gladbach, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,772

Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317369

Int. Cl.³ D01H *15/02, 1/135*

U.S. Cl. 57—263 **5 Claims**



1. Method for starting the operation of a friction spinning machine, including friction surfaces movable in opposing directions for forming a spinning wedge; the friction surfaces being movable in a spinning direction during a spinning operation, a device for supplying fiber to the spinning wedge, at least one suction device acting on the spinning wedge, a suction tube supplied with suction air, and a thread withdrawal device, which comprises:

stopping the fiber supply and the motion of the friction surfaces;

stopping the suction;

moving the suction tube through the spinning wedge in a given direction for sucking in thread and fiber remains;

subsequently sucking a thread through the suction tube;

moving the suction tube out of the spinning wedge in a direction opposite said given direction depositing the thread in the spinning wedge;

resuming the suction at least as late as the step of moving the suction tube out of the spinning wedge;

moving the friction surfaces in a direction opposite the spinning direction removing the twist of the thread and loosening the thread;

subsequently stopping the motion of the friction surfaces again;

starting the fiber supply again;

moving the friction surfaces in the spinning direction with increased speed; and

coordinating and increasing the fiber supply, the motion of the friction surfaces and the thread withdrawal until a normal spinning operation is established.

4,539,805

PROCESS AND APPARATUS FOR PRODUCING EASILY DYEABLE POLYESTER FALSE-TWISTED YARNS

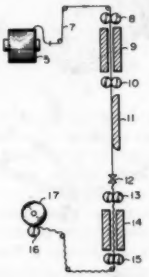
Norio Ukai, Nobeoka, and Katsushige Tomizuka, Takatsuki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 18, 1983, Ser. No. 467,849

Claims priority, application Japan, Feb. 19, 1982, 57-24561; Aug. 7, 1982, 57-137611; Oct. 2, 1982, 57-172518

Int. Cl.³ D02G *1/02, 3/02*

U.S. Cl. 57—290 **24 Claims**



1. A process for the producing a false-twisted polyester yarn, which comprises heat-treating a yarn consisting of an as-spun polyester fiber having a mean birefringence index (n) of from 15×10^{-3} to 150×10^{-3} at a heat-treating heater temperature of 190 to 290° C. for 0.2 to 2.0 seconds, cooling the heat-treated yarn to a temperature lower than the heat treatment temperature, and then continuously subjecting the heat-treated yarn to a false twisting treatment.

4,539,806

FIBER FEED ARRANGEMENT

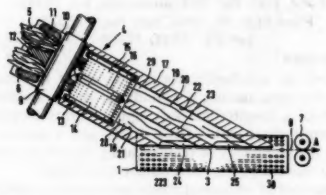
Fritz Stahlecker, Josef-Neidhart Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,453

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 3322394

Int. Cl.³ D01H *7/892, 7/898*

U.S. Cl. 57—400 **18 Claims**



1. Apparatus for open end friction spinning comprising:

a pair of friction rollers rotatably drivable in the same direc-

tion and arranged adjacent one another to form a yarn forming wedge shape gap therebetween,

opening device means for opening fiber band means into individual fibers,

fiber feed channel means leading from the opening device means to fiber feed channel mouth means opening toward the yarn forming gap,

and yarn withdrawal means for withdrawing yarn in the longitudinal direction of the yarn forming gap,

wherein, said opening device means includes opening roller means having at least one opening roller for simultaneously opening a plurality of separate fiber bands making up the fiber band means and wherein the fiber feed channel means is divided in cross-section into plurality of sections having respective channel mouth section means opening into respective different locations in the longitudinal direction of the yarn forming gap.

4,539,807

OPEN END FRICTION SPINNING APPARATUS

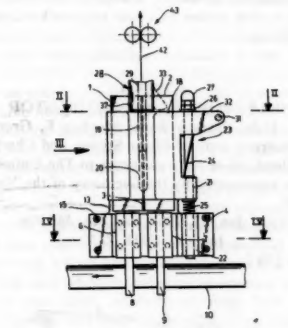
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Del.X

Filed Dec. 5, 1983, Ser. No. 558,281

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1982, 3300637

Int. Cl.³ D01H *7/882*

U.S. Cl. 57—401 **35 Claims**



1. Open end friction spinning machine having machine frame means and at least one spinning unit, each spinning unit comprising:

a pair of friction rollers disposed adjacent one another to form a wedge shaped yarn forming gap therebetween;

fiber supply means for supplying fibers to the wedge shaped gap, said fiber supply means including fiber feed channel means opening adjacent the wedge-shaped gap;

yarn withdrawing means for withdrawing formed yarn from the wedge shaped gap; and

housing means surrounding at least a portion of the friction rollers defining the wedge shaped gap,

wherein said housing means includes two housing parts separated from one another in a region of a plane extending substantially parallel to the rotational axes of the friction rollers, a first of said housing parts being disposed at the side of the friction rollers opposite the wedge shaped gap and being arranged at the machine frame means, the second of said housing parts being disposed at the wedge shaped gap side of the friction rollers and being mounted for selective movement between a closed housing position for spinning operations and an open housing position with said wedge shaped gap being accessible from outside, said second housing part further carrying a portion of the fiber feed channel means which opens adjacent to the wedge shaped gap.

2. Open end friction spinning machine having machine frame means and at least one spinning unit, each spinning unit comprising:

a pair of friction rollers disposed adjacent one another to form a wedge shaped yarn forming gap therebetween;

bearing means for rotatably supporting the friction rollers,

fiber supply means for supplying fibers to the wedge shaped gap, said fiber supply means including fiber feed channel means opening adjacent the wedge-shaped gap;

yarn withdrawing means for withdrawing formed yarn from the wedge shaped gap; and

housing means surrounding at least a portion of the friction rollers defining the wedge shaped gap,

wherein said housing means includes two housing parts, a first of said housing parts being disposed at the side of the friction rollers opposite the wedge shaped gap and being arranged at the machine frame means, the second of said housing parts being disposed at the wedge shaped gap side of the friction rollers and being mounted for selective movement between a closed housing position for spinning operations and an open housing position with said wedge shaped gap being accessible from outside, said second housing part further carrying a portion of the fiber feed channel means which opens adjacent to wedge shaped gap, said first housing part extending axially along the length of the friction rollers to form a bearing body support receptacle means for accommodating the bearing means for the roller shafts.

4,539,808

FIBER CONTROL APPARATUS IN AN OPEN-END SPINNING FRAME

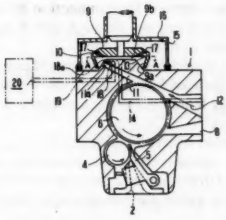
Noriaki Miyamoto, Toyota; Masanobu Shibuya, Kariya, and Masashi Kaneko, Tokai, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Mar. 17, 1983, Ser. No. 476,255

Claims priority, application Japan, Mar. 20, 1982, 57-44805

Int. Cl.³ D01H *7/882, 7/898*

U.S. Cl. 57—411 **12 Claims**



1. In an open-end spinning apparatus comprising a spinning rotor mounted for rotation and having an interior peripheral surface and a bottom surface which surfaces together define a spinning chamber of the rotor, and a fiber passage having a fiber outlet opening through which a stream of opened fibers are carried into said spinning chamber of the rotor and directed towards said interior peripheral surface, the improvement comprising means defining at least one nozzle having a nozzle opening located substantially adjacent to and separate from said fiber outlet opening, and means for emitting a continuous jet stream of compressed air from said nozzle opening towards and against said interior peripheral surface of the spinning rotor during the spinning operation, whereby said stream of opened fibers is guided to said interior peripheral surface by said jet stream of compressed air.

9. A method of guiding opened fibers in their passage from the fiber passage outlet opening in an open-end spinning frame to deposit upon the interior peripheral sidewall surface within

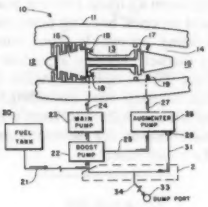
the spinning chamber of a spinning rotor during normal high speed operation of the rotor, comprising establishing a vacuum within said spinning chamber to draw said fibers into said chamber in a stream emanating from said fiber passage outlet opening, and introducing a continuously flowing jet of compressed air into said spinning chamber adjacent to said stream of fibers and directed towards and against said interior peripheral sidewall surface to guide said fibers across ambient air streams to deposit upon said peripheral sidewall surface.

4,539,809

FUEL PUMP VENT DRAIN SYSTEM

Richard L. Stanley, Mason, and George R. Henry, Loveland, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 28, 1983, Ser. No. 566,445
Int. Cl.³ F02G *3/00*
U.S. Cl. 60—39.094 **9 Claims**



1. A fuel drain system for a fuel pump of a jet engine having a fuel supply system including a main fuel supply line for providing fuel to said fuel pump for combustion in said engine, the said pump including valve means for discharging excess fuel from said pump upon termination of operation thereof, comprising:

a. a drain line, connected at a first end thereof to said valve means on said pump, and including connecting means at the second end thereof for connection to said main fuel supply line of said engine, through which said excess fuel may be drained from said pump;

b. a check valve in said drain line near said connecting means for allowing flow of fuel through said drain line only in a direction away from said pump and toward said main fuel supply line;

c. a discharge port open to ambient;

d. a vent line, operatively interconnecting said discharge port with said drain line at a point intermediate said pump and said check valve, for venting said drain line to ambient; and

e. means defining an orifice of predetermined size in said vent line near said drain line, said orifice means restricting flow through said vent line to a prescribed slow rate.

4,539,810

APPARATUS FOR CONTROLLING A GAS TURBINE ENGINE

Atsushi Watanabe, Shizuoka, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 22, 1983, Ser. No. 506,833
Claims priority, application Japan, Jul. 8, 1982, 57-117785
Int. Cl.³ F02C *3/10, 9/22*
U.S. Cl. 60—39.161 **9 Claims**

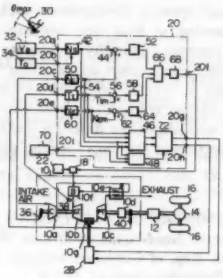
1. An apparatus for controlling a gas turbine engine of the type including a power turbine, a rotatable compressor, and variable nozzle means, disposed in an inlet portion of said power turbine and movable between at least an opened and a closed position, for controlling the flow rate of a gas into said turbine, said apparatus comprising:

means for detecting the actual rotation speed of the compressor;

interactive means for producing a desired compressor rotation speed value in response to user manipulation;

means for detecting atmospheric temperature;

means for correcting said desired compressor rotation speed value in response to said detected atmospheric temperature;



means for calculating the difference between said corrected desired compressor rotation speed value and said detected actual rotation speed; and

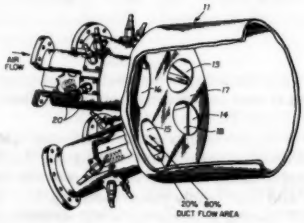
position changing means for changing the position of said variable nozzle means at a rate responsive to said calculated difference.

4,539,811

MULTI-PORT DUMP COMBUSTOR

Lawrence A. Dale, Severna Park; Stephen E. Grenleski, Jr.; James L. Keirsey, both of Silver Spring, and Charles E. Stevens, Highland, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1982, Ser. No. 346,986
Int. Cl.³ F02K *7/10*
U.S. Cl. 60—270.1 **2 Claims**



1. A multi-port dump combustor for a ramjet engine comprising,

a cylindrical chamber having a length to diameter ratio of about 1,3.

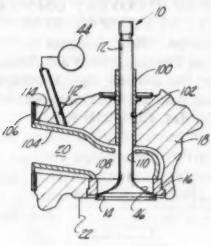
a plurality of ducts opening into one end of said chamber for admitting air-fuel mixture into said chamber,

said one end of said chamber being dome-shaped and said plurality of ducts each being inclined at an angle of about 20 degrees to the centerline of said chamber thereby effecting a flameholder function at the dome end, and a duct divider longitudinally positioned in each said duct to divide each said duct into two flow areas so that 80 percent of the flow area of each duct is on the inboard side and 20 percent is on the outboard side of the respective divider.

4,539,812
AIR COOLED EXHAUST VALVE

Bernard J. Rezy, Mobile, Ala., assignor to Teledyne Industries, Los Angeles, Calif.

Division of Ser. No. 831,384, , Pat. No. 4,184,328. This application Aug. 30, 1979, Ser. No. 71,319
Int. Cl.³ F01N *3/10*
U.S. Cl. 60—304 **1 Claim**



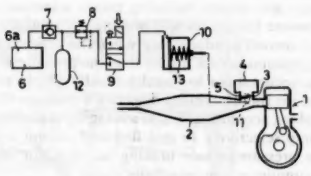
1. A fluid cooled valve construction for an engine, said engine having a housing, said valve construction comprising:
a valve having an elongated stem and an enlarged valve head connected to one end of said stem,
means for axially slidably mounting said stem in said housing,
a source of pressurized fluid, supplying a continuous flow of cooling fluid,
fluid passage means formed in said housing, said fluid passage means being fluidly connected at one end to said pressurized fluid source and fluidly connected at its other end to an annular opening around said valve stem adjacent said valve head whereby fluid continually flows through said opening, along said valve stem and across one axial end of said valve head to thereby cool said valve,
wherein said engine housing includes a manifold passageway through which said valve head and a portion of said valve stem extend and wherein said passage means further comprises a liner positioned in said manifold passageway, said liner being spaced away from said manifold passageway and defining a fluid passage intermediate said housing and said liner, and wherein said annular opening is an opening through said liner, whereby cooling fluid continually flows through said annular opening, along said portion of said valve stem and across said valve head to thereby continuously cool said valve stem portion and valve head.

4,539,813
EXHAUST SYSTEM CONTROL APPARATUS IN AN INTERNAL COMBUSTION ENGINE

Takao Tomita, Niiza; Takumi Tottori, Fujimi; Yasuo Terada, Miyoshi; Hideki Toyota, Fujimi, and Masahiro Akiba, Kiyose, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1983, Ser. No. 484,883
Claims priority, application Japan, Apr. 14, 1982, 57-53005[U]; Jun. 11, 1982, 57-86075[U]
Int. Cl.³ F02B *27/02*
U.S. Cl. 60—314 **12 Claims**

1. An exhaust system control apparatus for an internal combustion engine, said apparatus comprising:
(a) an exhaust passage extending from said engine;
(b) a subsidiary chamber;
(c) a communication passage coupling said exhaust passage and said subsidiary chamber;
(d) an opening and closing valve positioned in said communication passage for opening and closing said passage and thereby communicating and cutting off flow between said exhaust passage and said subsidiary chamber;
(e) pressure driven actuator means coupled to said opening and closing valve, for operating said opening and closing valve means;
(f) pressure source means coupled to said actuator means for applying pressure to operate said actuating means;
(g) control valve means coupled between said pressure source means and said actuator means for controlling the application of pressure to and release pressure from said actuator means; and

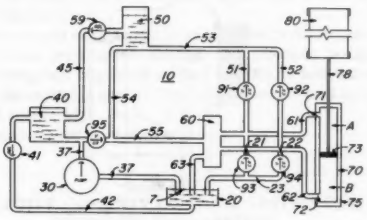


(h) operating means responsive to engine speed to rapidly operate said control valve means at a predetermined engine speed to apply or release the pressure on said actuator means to inturn rapidly open said opening and closing valve when the engine speed drops to below said predetermined speed and rapidly close said opening and closing valve when the engine speed increases to above said predetermined speed.

4,539,814
HYDRAULIC CARRIAGE DRIVE SYSTEM

Robert T. McKie, 2222 Stephen Ave., Boise, Id. 83706

Continuation-in-part of Ser. No. 274,818, Jun. 18, 1981. This application Feb. 29, 1984, Ser. No. 584,786
Int. Cl.³ B27B *31/00*
U.S. Cl. 60—413 **14 Claims**



1. A hydraulic drive system comprising:
a piston assembly including a closed cylinder having a reciprocating piston mounted therein and first and second conduit means connected to said cylinder adjacent opposing ends thereof;
a rod connected to said piston for reciprocal movement therewith and being adapted for connection to a load to reciprocally move the load along a fixed path;
an averaging accumulator operable to receive, hold, and dispense hydraulic fluid under pressure;
a hydraulic fluid reservoir;
pump means operable to pump fluid from said reservoir to said averaging accumulator;
a high pressure braking accumulator connected to said first and second conduits and operable to receive and hold fluid from said first and second conduits at a pressure greater than the pressure in said averaging accumulator for braking the piston and a load attached thereto in its respective reciprocal movement within said cylinder, said braking accumulator being operable to selectively deliver fluid under high pressure to said first and second conduits

of said cylinder for accelerating the piston in a desired direction; and

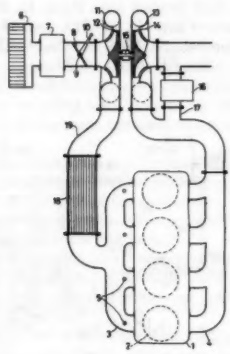
valve means connected to and in fluid communication with said averaging accumulator, said braking accumulator, said pump means, and said first and second conduits of said cylinder; said valve means operable to control fluid flow from said averaging accumulator, said braking accumulator, and said pump means to said first and second conduits selectively for accelerating and driving said piston and a load attached thereto in a desired direction, said valve means including means selectively directing a pressure fluid from said braking accumulator to said first and second conduits only when the pressure in said braking accumulator is higher than the pressure in said averaging accumulator to thereby rapidly accelerate said piston and for simultaneously directing a pressure fluid from said braking accumulator, said averaging accumulator and said pump selectively to said first and second conduits when the pressure in said braking accumulator and averaging accumulator is substantially equal.

4,539,815

SUPERCHARGING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo Auto S.p.A., Napoli, Italy

Continuation of Ser. No. 404,594, Jul. 30, 1982, abandoned. This application Dec. 13, 1984, Ser. No. 687,818
Claims priority, application Italy, Aug. 6, 1981, 23408 A/81
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—599 **5 Claims**



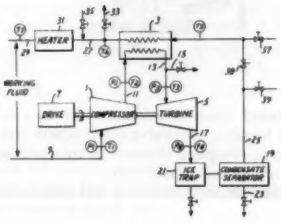
1. A supercharging system for an internal combustion engine of a motor vehicle, said supercharging system having an air capacity which is delivered during non-acceleration and acceleration periods of operating requirements of the internal combustion engine and wherein in the non-acceleration periods of the internal combustion engine air delivered by said supercharging system is only slightly compressed and thus only slightly heated with the air supplied by said supercharging system being available as a coolant; said supercharging system comprising compressor means for supplying air at different pressures and in different volumes to meet different air capacities required during both non-acceleration and acceleration periods of the internal combustion engine, said compressor means having coupled thereto conduit means for delivering air from said compressor means to the internal combustion engine, and a self-contained heat exchanger means mounted in said conduit means, said heat exchanger means being in the form of an accumulator for absorbing heat of air compressed by said compressor during the acceleration periods and for releasing heat to air slightly compressed by said compressor means during the non-acceleration periods of the internal combustion engine whereby the temperature of the internal combustion engine and the supercharging system is maintained at a low degree and reduces the occurrence of engine knocking phenomena, and said accumulator being in the form of a block composed of an assembly of thin metal walls extending longitudinally of said conduit means and permitting air to flow therebetween.

4,539,816

HEAT AND LIQUID RECOVERY USING OPEN CYCLE HEAT PUMP SYSTEM

Bryce J. Fox, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 250,558, Apr. 3, 1981, abandoned. This application Jan. 24, 1983, Ser. No. 460,482
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—87 **12 Claims**



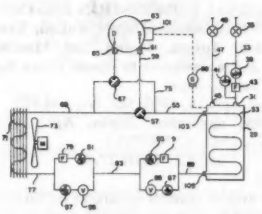
1. Apparatus for removing condensable vapor from a gas entering at nominally atmospheric pressure consisting essentially of, in sequence, means for compressing said entering gas to pressures not exceeding about 60 psia, means for cooling said compressed gas, single expansion means for expanding said compressed gas back to its nominal entering pressure to further cool said gas to temperatures below 0° C. and means for separating condensate from said gas, said apparatus further including means for causing said expanded gas to cool said compressed gas prior to expansion, said compressing and expanding means having efficiencies at least about 70%, and pressure ratios of about 1.3:1 to about 4:1.

4,539,817

REFRIGERANT RECOVERY AND CHARGING DEVICE

Michael J. Staggs, 3721 Dawn Dr., North Richland Hills, Tex. 76118, and Gary D. Starnes, 804 Edith, Irving, Tex. 75061

Filed Dec. 23, 1983, Ser. No. 564,757
Int. Cl.³ F25B *45/00*
U.S. Cl. 62—149 **4 Claims**



1. A servicing device for recovering refrigerant from a totally separate and independent cooling system of the type having a compressor for circulating a compressible refrigerant in a closed, pressurized system between a condenser and an evaporator to provide a cooling effect, the servicing device comprising;

a storage container having an interior and having a fill port

which is adapted to be connected by a fluid conduit to said totally separate and independent closed, pressurized system;

heat exchange coils located within the interior of said storage container in direct contact with refrigerant which is drawn from said totally separate and independent closed, pressurized system into the interior of said container, for cooling said container to thereby create a low pressure atmosphere within said storage container and to maintain a pressure gradient between said storage container and said totally separate and independent closed, pressurized system to draw refrigerant from said totally separate and independent closed, pressurized system into said storage container through said fluid conduit and fill port; and

wherein said heat exchange coils located within said storage container interior are cooled by a refrigeration system distinct from the system being serviced including a compressor which supplies compressed refrigerant gas to a condenser which, in turn, supplies condensed refrigerant liquid through an expansion valve to said heat exchange coils to cool said coils.

4,539,818

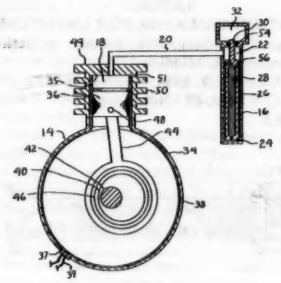
REFRIGERATOR WITH A CLEARANCE SEAL COMPRESSOR

Noel J. Holland, Burlington, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Continuation of Ser. No. 487,513, Apr. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 308,530, Oct. 5, 1981, abandoned, which is a continuation of Ser. No. 181,152, Aug. 25, 1980, abandoned. This application Sep. 21, 1984, Ser. No. 653,486

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—6 **15 Claims**



1. A helium cryogenic refrigerator of the type comprising a reciprocating displacer within a refrigerator cylinder, the displacer being driven in a reciprocating motion by the pressure differential across a fluid seal between helium gas in the refrigerator cylinder and gas in a gas spring volume, the refrigerator cylinder being in fluid communication with a compressor space in a compressor cylinder, the compressor space and the refrigerator cylinder defining a closed working volume of helium gas which is compressed and expanded by a piston in the compressor cylinder which is driven by a rotary motor through a crank mechanism in a sealed crankcase, the only fluid seal between a control volume in the crankcase at one end of the compressor piston and the working volume at the other end of the compressor piston and every other fluid seal in communication with the working volume being a low friction extended clearance seal between a hard, smooth piston wall and a hard, smooth cylinder wall, the hardness of each of the piston wall and the cylinder wall surfaces being at least about 60 on the Rockwell C scale, at least one of the piston and cylinder walls comprising ceramic.

4,539,819

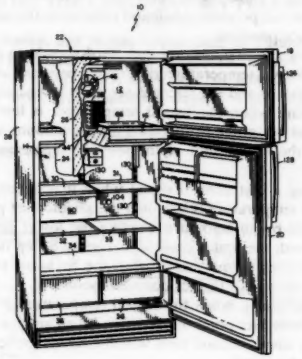
REVERSIBLE MEAT KEEPER FOR REFRIGERATOR

Donald Alba, Marengo, and Michael A. Hawkes, South Amana, both of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Sep. 19, 1984, Ser. No. 652,023

Int. Cl.³ F24F *3/16*

U.S. Cl. 62—78 **14 Claims**



1. The method of reversing the side that a cold air meat keeper is mounted in a refigerator compartment having a plenum behind its back wall for supplying said meat keeper, comprising the steps of:

removing said meat keeper from a premounted compartment position where a conduit extending rearwardly from said meat keeper couples with a first port in said back wall of said compartment to supply cold air from said plenum to said meat keeper;

removing a plug from a second port in the back wall of said compartment;

remounting said meat keeper in an alternate position spaced from said premounted position, said alternate position providing self alignment of said conduit to said second port for receiving cold air through said second port to said meat keeper; and

covering said first port with said plug.

4,539,820

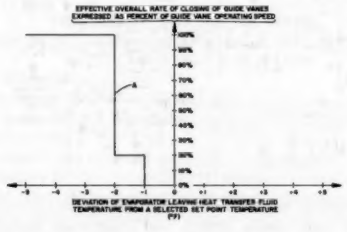
PROTECTIVE CAPACITY CONTROL SYSTEM FOR A REFRIGERATION SYSTEM

Thomas M. Zinsmeyer, Pennellville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 14, 1984, Ser. No. 610,159

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—201 **4 Claims**



1. A protective method of operating a refrigeration system having a microcomputer system for controlling the capacity of

the refrigeration system to prevent freezing of a heat transfer fluid, which comprises the steps of:

generating a first signal indicative of a selected at point temperature for a heat transfer fluid cooled by operation of the refrigeration system;

sensing the temperature of the heat transfer fluid cooled by operation of the refrigeration system and generating a second signal indicative of this sensed temperature;

generating a third signal indicative of a lower limit of a selected temperature deadband relative to the selected set point temperature;

processing the first, second and third signals to determine the relative temperature difference between the sensed temperature and the selected set point temperature;

determining when the sensed temperature is less than the selected set point temperature by an amount which exceeds the lower limit of the selected temperature deadband;

generating a first control signal when it is determined the sensed temperature is less than the selected set point temperature by an amount exceeding the lower limit of the deadband; the first control signal being a step function of the relative temperature difference between the sensed temperature and the set point temperature;

then determining when the sensed temperature is less than the selected set point temperature by an amount which is greater than a second limit which exceeds the lower limit of the deadband;

generating a second step function control signal when the sensed temperature is less than the selected set point temperature by an amount greater than the second limit;

reducing the capacity of the refrigeration system at a relatively slow first effective overall rate in response to the generated first control signal, thereby to bring the sensed temperature back to the set point temperature at a gradual controlled rate; and

rapidly reducing the refrigeration system capacity at a maximum second effective overall rate greater than the first rate in response to the generated second control signal to thereby prevent freezing of the heat transfer fluid.

4,539,821

CAPACITY CONTROL DEVICE FOR CONTROLLING A VARIABLE DISPLACEMENT COMPRESSOR IN AN AIR CONDITIONING SYSTEM

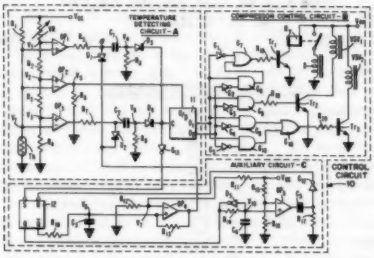
Yasuji Tamura, Ojima, Japan, assignor to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 468,329, Feb. 22, 1983, abandoned. This application Dec. 18, 1984, Ser. No. 682,500

Claims priority, application Japan, Feb. 20, 1982, 57-25251

Int. Cl.³ F25B *1/00*

U.S. Cl. 62—228.5 **12 Claims**



1. A variable displacement control device for a compressor in an air conditioning system, said compressor including a variable dispiacement device to change the capacity of said compressor, said control device comprising:

a voltage source;

actuating means for actuating said variable displacement device; and

control circuit means coupled to said voltage source and said actuating means for energizing said actuating means to actuate said variable displacement device to change the refrigeration capacity of said compressor, said control circuit means including

evaluating means for evaluating the required refrigerating capacity of said refrigerating system and generating a control signal for actuating said variable displacement device to change the refrigerating capacity of said compressor between a small, medium and large volume as a funcion of the required refrigerating capacity of said air conditioning system, said evaluating means includes temperature detecting means for detecting the temperature of the air generated by the air conditioning system and providing first and second output signals generated by comparing the detected temperature to first and second predetermined temperature levels, said first and second output signals being coupled to counting means, wherein said counting means counts up in response to said first output signal when said second output signal is in a first state and counts down in response to said first output signal when said second output signal is in a second state, and

timing means coupled to said counting means and said temperature detecting means for generating a third output signal a predetermined period after the generation of said first output signal, wherein said counting means counts up in response to said third output signal when said second output signal is in said first state and counts down in response to said third output signal when said second output signal is in said second state, said control signal being generated by the output of said counting means.

4,539,822

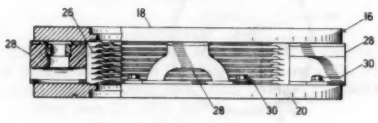
VIBRATION ISOLATOR FOR CRYOPUMP

Mark L. Sundquist, Madison, Wis., assignor to National Electrostatics Corporation, Middleton, Wis.

Filed Feb. 27, 1984, Ser. No. 584,116

Int. Cl.³ B01D *8/00*

U.S. Cl. 62—55.5 **6 Claims**



1. A vibration isolator for mounting a cryopump expander module on a vacuum chamber comprising

a pair of spaced parallel flanges sized and shaped so as to be easily mated with vacuum-tight connection to the cryopump expander module and the vacuum chamber, each flange having a circular port formed extending through it;

a generally cylindrical bellows assembly extending between the flanges, the open ends of the bellows assembly surrounding the ports in the respective flanges to form a vacuum-tight passage through the isolator, the bellows assembly functioning as a spring isolator and coupling between the flanges; and

a plurality of high damped resilient isolators mounted between the flanges in parallel with the bellows assembly, the isolators being both semi-rigid and resilient so as both to hold the flanges apart and to damp the oscillations of the bellow assembly, the spring and damping characteristics of the bellows assembly and isolators being selected so that the resonant frequency of the combination is lower than the high frequency vibrations from the expander module.

4,539,823
REFRIGERATION SYSTEM

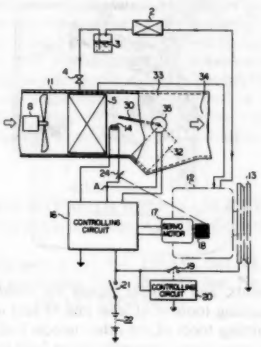
Yasuyuki Nishi; Masao Sakurai, both of Oobu, and Masashi Takagi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 359,985, Mar. 19, 1982, abandoned. This application May 29, 1984, Ser. No. 614,713

Claims priority, application Japan, Mar. 27, 1981, 56-45950; Apr. 3, 1981, 56-50741; Apr. 13, 1981, 56-55265; May 22, 1981, 56-78410

Int. Cl.[3] F25B *1/00;* B60H *3/04*

U.S. Cl. 62—228.5 13 Claims



1. An air conditioning system comprising:

a duct defining therein an air passage having a downstream end open to a chamber to be air-conditioned;

a refrigeration system including:

a variable capacity refrigerant compressor including means for varying the displacement of said compressor and means for driving said compressor displacement varying means; and an evaporator disposed in said air passage and being in fluid-flow communication with the intake side of said compressor;

means for causing air to flow through said evaporator and through said duct into said chamber;

a heater disposed in said duct downstream of said evaporator and being operative to heat at least a part of the air which has passed through said evaporator;

means for controlling the heating of the air by said heater; and

means for controlling the capacity of said compressor, said capacity controlling means including:

sensor means operative to detect a condition related to the cooling operation of said evaporator and emit a first electric signal representing the condition thus detected;

means for detecting the position of said air heating controlling means to emit a second electric signal representing the position thus detected; and

electric circuit means operative in response to said first and second electric signals from said sensor means and from said position detecting means to actuate said driving means for thereby varying the displacement of said compressor whereby the capacity of said refrigeration system can be controlled, said electric circuit means including:

(a) means emitting a third electric signal in accordance with the ratio between said first and second electric signals;

(b) a first comparator means operative to compare said third electric signal with a first electric reference signal to emit a first electric output;

(c) a second comparator means operative to compare said third electric signal with a second electric reference signal different from said first electric reference signal to emit a second electric output;

(d) first electric actuating means responsive to said first electric output to actuate said driving means in a direction to decrease the compressor displacement; and

(e) a second electric actuating means responsive to said second electric output to actuate said driving means in a direction to increase the compressor displacement.

4,539,824
APPARATUS FOR CONTINUOUSLY FREEZING LIVER PIECE

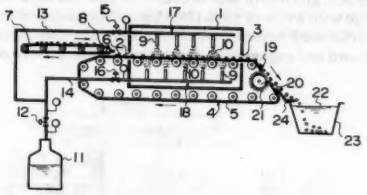
Yasuo Kuraoka, and Nobuo Sakao, both of Yatabe, Japan, assignors to Hoxan Corporation, Sapporo, Japan

Filed Oct. 9, 1984, Ser. No. 658,628

Claims priority, application Japan, Mar. 15, 1984, 59-37096[U]

Int. Cl.[3] F25D *25/04*

U.S. Cl. 62—380 3 Claims



1. An apparatus for continuously freezing liver pieces comprising:

a freezing box having an inlet and an outlet,

a conveyor movable from the inlet to the outlet of said freezing box and having a mesh belt,

a number of nozzles provided laterally through the box at the upside of the mesh belt of said conveyor for injecting gaseous helium,

a supplying guide portion formed at the head of the inlet at the upside of the mesh belt for supplying and placing the liver pieces,

a rotatable roller journaled at the striking-off and exhausting portion disposed inside the striking-off and exhausting portion at the head of the outlet at the upside of the mesh belt in an outside contacting state laterally of the mesh belt, said roller having a number of striking-off projections projected from the surface thereof for striking-off the frozen liver pieces on the mesh belt by the insertion of the projections into the mesh belt.

4,539,825
DEVICE SELECTING THE NEEDLES ON THE DIAL PLATE OF EITHER SINGLE OR MULTIPLE FEED, SINGLE CYLINDER CIRCULAR KNITTING MACHINES FOR THE MANUFACTURE OF RIBBED FABRIC

Cesare Colosio, Botticino Sera, Italy, assignor to Colosio Cesare S.r.l., Italy

Filed May 27, 1983, Ser. No. 498,964

Claims priority, application Italy, Jun. 9, 1982, 5177 A/82

Int. Cl.[3] D04B *9/22, 9/06, 35/00*

U.S. Cl. 66—24 4 Claims

1. A device for selecting dial plate needles in a circular knitting machine for manufacturing ribbed fabric, comprising:

a frame (**18**);

a cylinder (**10**) rotatably mounted to said frame;

a plurality of vertical needles (**11**) mounted on said cylinder;

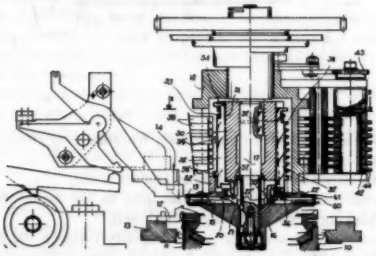
a dial plate (**16**) having a plurality of radial horizontal needle grooves and mounted for rotation with said cylinder;

a plurality of horizontal needles (**15**) each mounted in one horizontal needle groove of said dial plate, each needle having a butt (**20**) and a rear tail (**21**) extending radially inwardly toward a center of said dial plate;

a stationary cover (22) connected to said frame and disposed over said dial plate, said cover having an annular track (25) for receiving each needle butt (20) and for holding a horizontal needle connected to each butt in a radially inward rest position, said cover including at least one cam means (26) for engaging horizontal needle butts to move horizontal needles radially outwardly during a looping operation, and another cam means (27) for engaging horizontal needle butts to move horizontal needles during a mesh transferring operation for transferring a mesh to said vertical needles, said cover including further cam means (37), (46), (47);

a sleeve (30) rotatably mounted to said frame and above said dial plate for rotation with said dial plate, said sleeve including a plurality of vertical grooves each coinciding with a horizontal needle groove of said dial plate;

a plurality of jacks (32) each mounted for vertical sliding movement and radial swinging movement in one of said vertical grooves of said sleeve, each jack having a vertical edge with a row of teeth (38) therealong, each jack having a bifurcated bottom end with a long leg (35) extending toward and engaging in a horizontal needle groove of said



dial plate radially inwardly of a corresponding horizontal needle (15) to act on a tail (21) of a corresponding needle, and a short leg (36) extending for engagement with said further cam means (37, 46, 47) of said cover (22), said further cam means controlling the swinging movement of said jacks when said jacks are in operating positions thereof,

a plurality of selecting slides (39) mounted to said frame and cooperating with teeth (38) of said jacks (32) to control the selecting of vertical displacement of said jacks (32) from a rest position of each jack to said operating position of each jack; and

at least one pin drum (42,44) mounted for rotation to said frame and rotatable with said cylinder, sleeve and dial plate, for selective displacement of said selecting slides (39) toward and away from said teeth (38) of said jacks (32), said pinned drum controlling said selecting slides to selectively move said jacks from said rest position to said operating position of said jacks, said further cam means operating to move selected horizontal needles outwardly for selectively engaging said at least one cam means (26) and said other cam means (27).

4,539,826

KNITTING MACHINE

Eberhard Leins, Filderstadt, and Manfred Walter, Aichtal, both of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Fed. Rep. of Germany

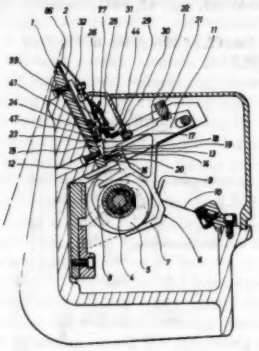
Filed Jun. 21, 1983, Ser. No. 506,283

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225345

Int. Cl.[3] **D04B** *7/04*

U.S. Cl. 66—64 **28 Claims**

1. A knitting machine comprising: at least two needle beds, a plurality of knitting tools movably mounted in said needle beds, a plurality of eccentric cam means rotatably mounted in said needle beds and being disposed with angular offset with respect to each other, a plurality of driving elements coupled with and alternatingly movable by said cam means in at least two opposite directions, coupling means for drivingly coupling said driving elements and said knitted tools for at least raising said knitting tools into knitting positions by movement of said



driving elements, and transfer means for transferring loops formed on knitting tools of at least one of said needle beds to associated knitting tools of the other needle bed, said transfer means having cam means movable past at least said one needle bed in a direction transversely of said knitting tools for coupling said knitting tools with said driving elements such that said knitting tools are raised beyond said knitting positions into transfer positions by said movement of said driving elements.

4,539,827

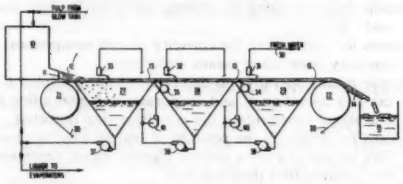
BELT WASHING IMPROVEMENTS

Edward P. Klein, Covington, Va., and Alfred H. Nissan, Scarsdale, N.Y., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 474,691, Mar. 11, 1983, abandoned. This application Feb. 27, 1984, Ser. No. 583,642

Int. Cl.[3] **B01D** *35/20;* **D21C** *9/02;* **B08B** *3/12*

U.S. Cl. 68—3 SS **4 Claims**



1. A continuous belt apparatus for drawing and flushing suspension liquor from a slurry comprising liquor and fiber, said apparatus comprising:

A. an endless belt screen routed for travel in a longitudinal direction over a plurality of liquor receiving vessels distributed along a length portion of said belt, each vessel being defined by a pair of transversely extending compartment boundaries;

B. means for depositing said slurry onto the topside of said belt screen at one end of said length portion;

C. means for impressing a pressure differential across said belt screen length portion between said compartment boundaries relative to an atmosphere above said belt supported slurry and said liquor receiving vessels whereby a substantial portion of the fiber suspension liquor constitu-

ency of said slurry is induced to drain through said belt screen into said receiving vessels leaving said fiber supported on said belt screen as a loose, wet mat having a first porous matrix of interstitial flow channels formed therein which contain a residual portion of said suspension liquor;

D. means for softly depositing onto the topside of said mat at a first point between compartment boundaries of a respective vessel, a displacement flow of wash liquor having a solids constitutency of lower concentration than that of residual suspension liquor remaining in the flow channels of said mat pore matrix; and,

E. sonic frequency disturbance means positioned substantially transversely of the belt traveling direction at a second point between compartment boundaries passed by a point on said belt screen prior to said first point for opening previously closed pore and flow channels by rearranging said first pore matrix to form a second pore matrix along the bottom side of said mat adjacent said respective vessel whereby suspension liquor confined in small and obstructed flow channels in said first pore matrix is induced to drain more completely and uniformly.

4,539,828

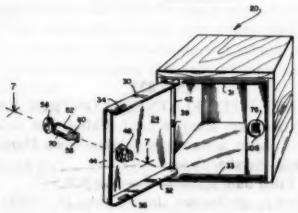
SECURITY LOCK BOX WITH REMOVABLE KEY PLUG

Walter Teleky, 7002 Boulevard East, Apt. 11B, Guttenberg, N.J. 07093

Continuation-in-part of Ser. No. 199,337, Oct. 21, 1980, abandoned. This application Mar. 25, 1982, Ser. No. 361,963

Int. Cl.³ E05B *9/04*

U.S. Cl. 70—369 **15 Claims**



1. A security system utilizing a removable key plug comprising receptacle means for the safekeeping of valuables, said receptacle means including an access opening, closure means positionable within the access opening, a latching mechanism for securing the closure means in a locked position within the access opening, locking means mounted to said closure means, said locking means including a cylinder housing, at least one key plug, said key plug being removably accommodatable within the cylinder housing for actuating the latching mechanism, said key plug further including retainer means for simultaneously engaging the cylinder housing when the latching mechanism is actuated to a locked position and for disengaging the key plug for withdrawal from the cylinder housing when the latching mechanism is in an open position.

4,539,829

CYLINDER LOCK PERMITTING EXTRACTION OF BROKEN KEY

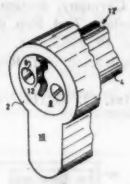
Benny Givol, Jerusalem, Israel, assignor to Micha Altmann and Yoel Ben-Yehuda, both of, Israel, part interest to each

Continuation-in-part of Ser. No. 261,323, May 7, 1981, abandoned. This application Mar. 22, 1983, Ser. No. 477,788

Int. Cl.³ E05B *15/08*

U.S. Cl. 70—454 **5 Claims**

1. A cylinder lock comprising a housing and, rotatably accommodated in said housing, a cylinder having an axially extending key slot for reception of a mating key to permit rotation of said cylinder within said housing by action of said mating key to unlock saod lock, an end plate having a similar key slot cut therethrough, and means for removably attaching said end plate to one end of said cylinder with the end plate completed countersunk in said lock housing and with the key slot of said end plate in register with the key slot of said cylinder to permit insertion, through said end plate, into said cylinder, of the mating key, whereby in case of a broken key, said end plate can be removed form said cylinder, thereby exposing a portion of the broken key, facilitating extraction thereof.



4,539,830

SYSTEM FOR MAKING THIN METAL STRIP

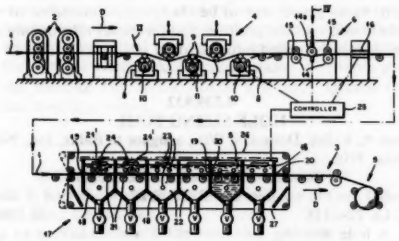
Oskar Noé; Andreas Noé, both of Mühlheim-Ruhr, and Rolf Noé, Berlin-Charlottenburg, all of Fed. Rep. of Germany, assignors to BWG Bergwerk-und Walzwerk-Maschinenbau GmbH, Duisburg, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,265

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1982, 3234160

Int. Cl.³ B21B *15/00, 37/02, 45/02;* B21D *1/02*

U.S. Cl. 72—12 **4 Claims**



1. A method of making thin steel strip, the method comprising the steps of:

hot-rolling a strip workpiece to a thickness of at most 1.5 mm, a width of at least 600 mm, full plasticity, and a temperature of about 1100° C.;

stretch-bend leveling the hot-rolled strip workpiece immediately after hot-rolling it and while the workpiece is still about 1100° C. and very plastic;

measuring the width and thickness of the strip workpiece;

tensioning the strip workpiece with a predetermined tension while stretch-bend leveling it in accordance with the measured width and thickness of the strip;

rapidly cooling the workpiece immediately after stretch-bend leveling it; and

thereafter coiling up the workpiece.

4,539,831

METHOD FOR SETTING THE STROKE OF MOVABLE ROLLING UNITS, AND CRANKSHAFT ROLLING MACHINE FOR IMPLEMENTING SAID METHOD

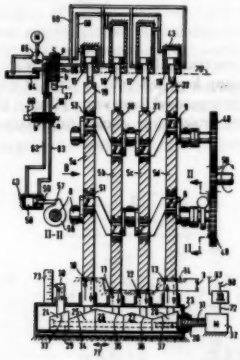
Garri Berstein; Willi Hansen, and Rudolf Winkens, all of Erkelenz, Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt GmbH, Erkelenz, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 562,963

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1983, 3320370

Int. Cl.³ B21H *7/00*

U.S. Cl. 72—110 **18 Claims**



1. The method of setting the stroke length of at least one movable rolling equipment unit of a crankshaft rolling machine, said unit including rolling dies adapted to support a crankshaft to be rolled and being mounted on a pair of synchronously rotatably supported cranks, said unit being movable relative to said cranks in a linear path corresponding to the desired stroke and being lockable relative to said cranks at selected positions along said path comprising the steps of shifting said unit along said linear path to a selected position relative to said cranks in accordance with the desired stroke length, causing said unit to be clampingly connected to said cranks at said selected position, and thereafter introducing said crankshaft to be rolled into said dies.

4,539,832

HOLE SIZING TOOL

Joseph A. Koller, Dousman, Wis., assignor to Balax, Inc., North Lake, Wis.

Filed Sep. 19, 1983, Ser. No. 533,360

Int. Cl.³ B23G *7/02*

U.S. Cl. 72—118 **15 Claims**

1. A hole re-sizing tool comprising a shaft having an axis, said shaft having a rear driven end and a front work-entering end provided with a swaging tap section having forming threads increasing in size axially away from the front end shaped to upset the material of a work piece to at least partially form a thread, a threadless ramp surface on said tool beginning at the end of the swaging tap section furthest from the front end of the tool, said surface having the form of a helical spiral having a surface all parts of which contain substantially straight lines in the plane of said axis, the smallest turn of said ramp being directly adjacent the root of the largest turn of the swaging tap section and having substantially the same radius as said root, said helical spiral increasing in diameter in a direction along the helical spiral to a maximum diameter smaller than the maximum diameter of the crest of the thread in said swaging tap section, said ramp surface being shaped to flatten threads formed by said swaging tap section to the maximum diameter of said ramp.

5. The device of claim **1** in which the helical spiral ramp section of the tool is followed smoothly by a burnishing tool

section having an unchanging maximum radius, said burnishing section being farther from the front end than said ramp.

4,539,833

ROLLING MILL WITH FLATNESS CONTROL FACILITY

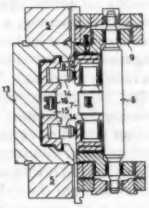
Heiji Kato, Yokosuka; Kanji Kizaki, Ebina, and Seizo Baba, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Jan. 4, 1984, Ser. No. 568,118

Claims priority, application Japan, Jan. 18, 1983, 58-6366; Jan. 19, 1983, 58-6819

Int. Cl.³ B21B *13/14*

U.S. Cl. 72—243 **5 Claims**

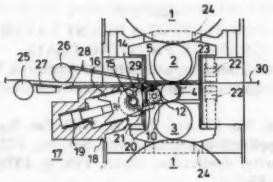


1. A rolling mill comprising upper and lower work rolls, upper and lower backup rolls, an intermediate roll interposed between at least one of said work rolls and the corresponding backup roll, said intermediate roll being offset in the direction of a rolling line, a pressure roll disposed on the intermediate roll offset side and abutting on said intermediate roll, said pressure and intermediate rolls having bearing boxes, the bearing boxes of said pressure roll being respectively engaged with the bearing boxes of said intermediate roll so as to be movable in the direction of the rolling line, the bearing boxes of the pressure roll being vertically immovable with respect to the bearing boxes of the intermediate roll, and means disposed on the intermediate roll offset side for pressing said pressure roll against said intermediate roll.

4,539,834
ROLLING MILL

Toshio Iwanami, Yokohama, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 15, 1984, Ser. No. 580,269
Claims priority, application Japan, Feb. 24, 1983, 58-26240[U]; Mar. 1, 1983, 58-29141[U]
Int. Cl.³ B21B *13/14*
U.S. Cl. 72—243 7 Claims

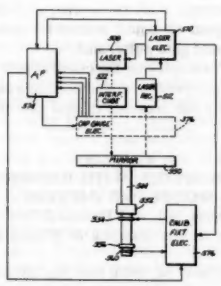


1. In a rolling mill of the type in which a work roll is offset by a predetermined distance from a reduction line and a bending force is exerted to the work roll from a sectionalized roll through a horizontal intermediate roll on the offset side of said work roll, whereby flatness of a workpiece is controlled, the improvement which comprises connecting means interposed between each end of a shaft of said work roll and a corresponding end of a shaft of said sectionalized roll, said connecting means being elastic and rotatable about respective axes of said work roll and sectionalized roll, said connecting means supporting said horizontal intermediate roll which is adapted to move in a plane containing the axes of said work roll and sectionalized roll.

4,539,835
CALIBRATION APPARATUS FOR CAPACITANCE HEIGHT GAUGES

John R. Shambroom, Lexington, Mass., and Alan P. Sliski, Lincoln, Md., assignors to Control Data Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 546,760, Oct. 28, 1983,. This application Mar. 14, 1984, Ser. No. 589,902
Int. Cl.³ G01B *21/16*
U.S. Cl. 73—1 J 11 Claims

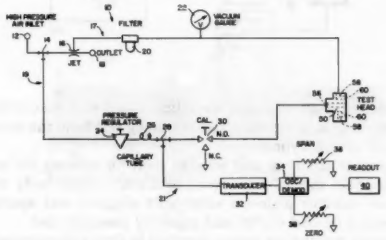


1. An apparatus for calibrating a capacitance height gauge having a capacitive sensor, comprising:
a base;
a laser interferometer assembly supported by said base;
an electrically conductive mirror movably supported on said base opposite to said laser assembly;
a means for supporting said capacitance gauge with said sensor oppositely disposed with respect to said mirror; and
a means for moving said mirror with respect to said laser interferometer, wherein said moving means positions said mirror a desired location from said sensor such that said sensor forms a capacitor with said mirror, and wherein said laser interferometer assembly is utilized to determine the distance between said sensor and said mirror, further comprising a means for obtaining an electrical reading from said capacitor comprised of said sensor and said mirror while said mirror is positioned at said desired location.

4,539,836
PACKAGE LEAK TESTER

Benny L. Hester, Winston-Salem, and William H. Graves, Jr., Pfafftown, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jul. 25, 1983, Ser. No. 516,872
Int. Cl.³ G01M *3/02*
U.S. Cl. 73—49.3 11 Claims



1. Apparatus for testing packages for leaks, comprising:
vacuum means for applying suction to hold the package in a position for testing;
puncturing means for producing an opening in the package;
positive pressure means for introducing pressure into the interior of the package through said opening, said pressure being regulated to a selected value relative to said vacuum means such that said positive pressure is elevated over a selected time period to a value in excess of said suction if the package meets leakage specifications, whereby a package meeting said specifications is thereby ejected from said testing position.

4,539,837
DRIVEN-CAPILLARY VISCOSIMETER

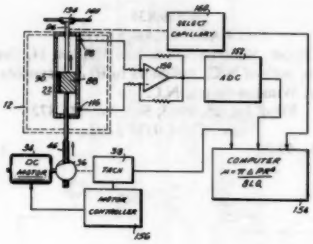
Harold T. Barnaby, Duncanville, Tex., assignor to Core Laboratories, Inc., Dallas, Tex.

Filed Aug. 17, 1984, Ser. No. 641,688
Int. Cl.³ G01N *11/04*
U.S. Cl. 73—55 14 Claims

10. Differential pressure viscosimeter for measuring the viscosity of a fluid, comprising
a hollow pressure cylinder having first and second ends and an interior wall, the cylinder including means for receiving a fill of said fluid for measuring its viscosity;
a piston disposed for axial movement in said cylinder and sealably contacting the interior wall thereof, the piston including a main piston body having a plurality of capillary passages disposed circumferentially about the axis of said piston and each extending axially through said main piston body, said piston further including a selector plate having an aperture therethrough selectively alignable with said capillary passages to permit passage of said fluid through and only through the selected passage;
a drive shaft connected to one of said main piston body and

said selector plate and extending through the first end of said cylinder;

a drive assembly coupled to said drive shaft and fixedly mounted relative to said cylinder for driving said piston axially in said cylinder, said drive assembly including a frame, bracket means mounting said cylinder relative to said frame, a controllable electric motor having an axle, a tachometer mounted on said axle and providing a signal indicative of the speed of the motor axle, a jack driven by said motor axle for driving said drive shaft axially, and control means for controlling the current to said motor in response to said signal;



a selector shaft affixed to the other of said main piston body and said selector plate and extending out from the second end of said cylinder;

a selector handle on said selector shaft for rotating the same to effect mutual rotation of said main piston body with said selector plate for selectively aligning said aperture with a desired one of said capillary passages; and

pressure monitoring means disposed in fluid communication with the interior of said cylinder for measuring the pressure differential in said fluid across the selected capillary passage while said piston is being driven.

4,539,838

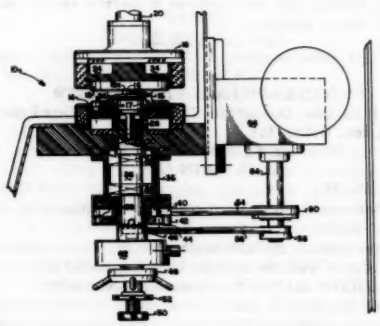
VARIABLE VOLUME DUAL ACTION RHEOMETER

M. Foster Fraleigh, 4524 Hudson Dr., Stow, Ohio 44224

Filed Oct. 21, 1983, Ser. No. 544,442

Int. Cl.[3] G01N *11/14*

U.S. Cl. 73—59 **6 Claims**



1. A multi-mode elastomeric testing device, comprising:

a measurement cavity formed at the junction of an upper and a lower platen;

a rotor disposed in said cavity, having sealment means to said cavity and including a head and shank portion;

a shaft in mechanical engagement with said shank;

means for transmitting oscillatory motion to said shaft, including a hub positioned on said shaft and detachably linked to an eccentric via a rod;

means for transmitting rotational motion to said shaft, including a first sprocket positioned on said shaft and mechanically linked to a second sprocket via a belt; and

a power source connected to both said transmission means and including a torque transducer;

wherein said hub is keyed to said shaft and said sprocket is received by said hub and rotates freely thereon.

4,539,839

DEVICE FOR TESTING A RESIST LAYER ON A GRAVURE PRINTING PLATE

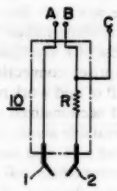
Satoru Horiguchi, Saitama, and Shinichi Amemiya, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Division of Ser. No. 173,816, Jul. 30, 1980, Pat. No. 4,406,160. This application Apr. 28, 1982, Ser. No. 372,572

Claims priority, application Japan, Feb. 8, 1979, 54-98845; Jan. 24, 1980, 55-6343

Int. Cl.[3] G01N *33/22, 33/44*

U.S. Cl. 73—73 **9 Claims**



1. A device for testing a resist layer on a gravure printing plate comprising:

a detecting probe including first and second conductors defining one end of said detecting probe, a resistor having a first end coupled to said first conductor and a second end, and a third conductor coupled to said second end of said resistor, said first and third conductors being coupled to a first output terminal and said second conductor being coupled to a second output terminal;

gate means for comparing an output of said detecting probe at said output terminals with at least a set value to provide a gate pulse;

oscillator means for providing clock pulses at a predetermined frequency;

a counter coupled to count said clock pulses during the presence of said gate pulse; and

display means for displaying the count of said clock pulses in said counter in a predetermined code as a detection of time represented by the presence of said gate pulse.

4,539,840

SOOTBLOWING SYSTEM WITH IDENTIFICATION OF MODEL PARAMETERS

John H. Klatt, Laurel, Md., and Thomas J. Scheib, Chesterland, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 14, 1983, Ser. No. 551,455

Int. Cl.[3] G01L *3/26*

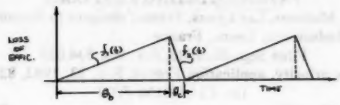
U.S. Cl. 73—112 **6 Claims**

1. A method of identifying a parameter (a_i) of a model for a rate of loss of boiler efficiency due to a sootblowing operation in one of a plurality of heat traps in the boiler, comprising:

measuring a time (θ_{bi}) since a last sootblowing operation in the i^{th} heat trap;

measuring an overall boiler efficiency (E) at a beginning of a sootblowing operation for the i^{th} heat trap;

measuring the change in efficiency (ΔE_i) in the boiler due to the sootblowing operation in the i^{th} heat trap; and



calculating the parameter (a_i) using the equation: for i-1,

$$M - \frac{\Delta E_i}{E} = a_i \theta_{bi}^{Ni} - \sum_{\substack{j=1 \\ j \neq i}}^{m} a_j ((T_i \theta_{ci})^{Nj} - T_j^{Nj})$$

where,

N_i=a coefficient for fouling rate in the model of the i^{th} heat trap

M is the number of heat traps in the boiler

θ_{ci}=time for sootblowing in the i^{th} heat trap

a_i=a model parameter for the i^{th} heat trap, and

T_h=the time since sootblowing in the j^{th} heat trap.

4,539,841

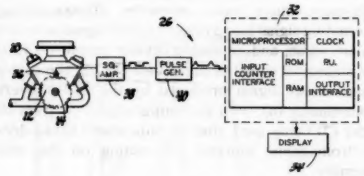
METHOD OF DETERMINING ENGINE CYLINDER COMPRESSION PRESSURE AND POWER OUTPUT

Thaddeus Schroeder, Sterling Heights, and William P. Ryan, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1984, Ser. No. 579,724

Int. Cl.[3] **G01M** *15/00*

U.S. Cl. 73—116 **4 Claims**



1. A nonintrusive method of diagnosing the peak compression pressure in the cylinders of an internal combustion engine having an output crankshaft comprising:

(A) establishing parameters for a diagnostic tool in preparation for performing a diagnostic peak compression pressure test including the steps of (1) measuring and recording the pressure in a cylinder of an engine of the type to later be diagnosed as a function of the angle α of the crankshaft over at least its compression phase to define a pressure curve $P(\alpha)$, (2) normalizing the pressure curve $P(\alpha)$ so as to have a peak magnitude of unity to define a normalized pressure curve $P_n(\alpha)$, the compression phase of the pressure curve $P_n(\alpha)$ being the same for all cylinders of all engines of the same type, (3) determining the torque transmitted to the crankshaft resulting from the normalized pressure curve $P_n(\alpha)$ to define a normalized torque curve $T(\alpha)$, (4) integrating the normalized torque curve from a predetermined crankshaft angle before top dead center of the cylinder to top dead center to obtain a normalized energy coefficient A, and (5) storing the normalized energy coefficient A for subsequent use in diagnosing engines of the same type and

(B) diagnosing the peak compression pressure in a cylinder of an engine of the same type including the steps of (1) measuring and recording the instantaneous speed of the engine to be diagnosed at least over the compression phase of the cylinder, (2) determining the change in the kinetic energy W of the engine from the change in the recorded engine speed from the predetermined crankshaft angle before top dead center to top dead center of the cylinder, (3) substituting the determined change in kinetic energy W of the cylinder and the stored normalized energy coefficient A into the expression $W=KAP_i$ where K is a predetermined constant for the engine and P_i is the unknown peak compression pressure of the cylinder, and (4) solving the expression for the peak compression pressure P_i of the cylinder, whereby the peak compression pressure of a cylinder is diagnosed by monitoring solely the instantaneous engine speed associated with the cylinder during engine operation.

4,539,842

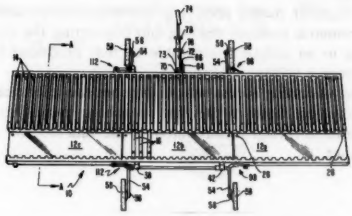
SPRAY PATTERN ANALYZER

William A. McCollum, New Castle, Del., and William Larsen, Bozeman, Mont., assignors to Accu Tech Associates, Inc., Bozeman, Mont.

Filed Sep. 15, 1983, Ser. No. 532,390

Int. Cl.[3] **G01M** *19/00*

U.S. Cl. 73—168 **6 Claims**



1. Apparatus for analyzing spray patterns comprising:

a collector tray having a trough formed therein;

a test tube having its longitudinal axis aligned parallel with the longitudinal axis of the trough and having a mouth mounted adjacent to an end of the trough;

a cart means for holding the collector tray in a horizontal position facing upwardly and for movably positioning the collector tray within a horizontal plane of a spray pattern.

4,539,843

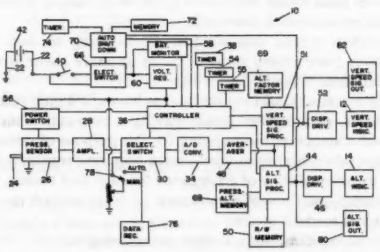
ALTIMETER AND VERTICAL SPEED INDICATOR

Fred W. Wise, Windsor, Pa., assignor to Aerologic, Inc., Windsor, Pa.

Filed Dec. 5, 1983, Ser. No. 558,383

Int. Cl.[3] **G01C** *21/10;* **G01L** *7/12*

U.S. Cl. 73—179 **22 Claims**



21. An instrument for determining the altitude of an aircraft comprising:

pressure sensor means producing an electrical signal varying

with the atmospheric pressure to which the instrument is subjected;

reference voltage means producing a fixed direct current voltage;

first switching means, with two inputs, one connected to the pressure sensor means output and one connected to the reference voltage means output and switching between the reference voltage means input and the pressure sensor means input;

analog to digital converter means connected to the switching means, and converting an analog signal from the switching means to a digital signal output;

signal processing means connected to the output of the analog to digital converter and modifying the signal to a numerical value representative of an altitude when the signal is from the pressure sensing means and representative of barometric pressure when the signal is from the reference voltage means;

display driver means connected to the signal processing means output;

digital indicator connected to the output of the display driver means and indicating the numerical value of the signal; and

data receiver means receiving information representing a barometric pressure reading and converting the information to an output comparable to that produced by the reference voltage means; and

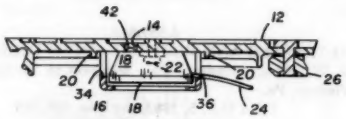
second switching means which switches the reference voltage means input of the first switching means from the reference voltage means output to the data receiver means output.

4,539,844

METER VAULT COVER WITH EXTERNALLY VISIBLE REGISTER

L. W. Grove, Jr., 409 Biggs Ave., Frederick, Md. 21701

Filed Feb. 6, 1984, Ser. No. 577,022
Int. Cl.³ G01F *15/06, 15/18*
U.S. Cl. 73—201 **6 Claims**



1. A vault cover, comprising:

a cover plate means, said cover plate means having a locking means associated therewith;

a window means, said window means being set into said cover plate means so as to be an aperture therethrough and made integral therewith;

a register means, said register means having a digital readout means, said register means having a connection means, said connection means being for the purpose of connecting said register means to a source requiring registration of a quantity of flow of a substance through said source, said quantity of flow of a substance to be registered on said digital readout means;

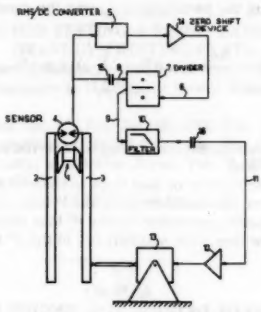
a carriage means, said carriage means being suitably affixed to said cover plate means, said register means being located within said carriage means, said register means being so located within said carriage means so that said digital readout means may be observed through said window means.

4,539,845

DRIVING SYSTEM FOR EXCITING A MECHANICAL COMPONENT AT ITS RESONANT FREQUENCY FOR FATIGUE-TESTING PURPOSES

Maurice Molimar, Les Lyons, France, assignor to Renault Vehicules Industriels, Lyons, France

Filed Sep. 20, 1983, Ser. No. 534,028
Claims priority, application France, Sep. 23, 1982, 82 16046
Int. Cl.³ G01M *7/00*
U.S. Cl. 73—578 **7 Claims**



1. A device for fatigue-testing a mechanical component be exciting this component (1), to which massive armatures (2, 3) may be attached, using an electromagnetic vibrator (13) fed by a generator,

characterized in that the said generator comprises a displacement sensor (4) inserted between two parts of a vibrating assembly (1, 2, 3) and generating a sinusoidal signal; a root-mean-square value converter (5) converting this alternating signal into a direct current signal of root-mean-square value; and an analog divider circuit (7) receiving the sinusoidal signal as numerator (8) and the root-mean-square value signal produced by the said converter as denominator (6), with the output signal (9) from this divider (7) being used after amplification (12) to drive the electromagnetic vibrator (13) acting on the vibrating assembly.

4,539,846

HIGH RESOLUTION IN SITU ULTRASONIC CORROSION MONITOR

Robert J. Grossman, Schenectady, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 10, 1984, Ser. No. 569,700
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—579 **15 Claims**

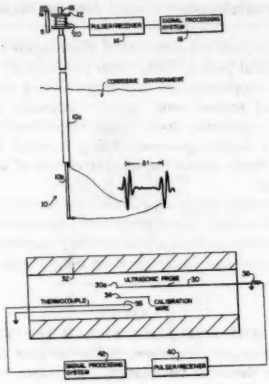
1. An in situ ultrasonic corrosion monitoring system comprising:

an elongate corrodible probe including at least one monitoring zone defined between first and second discontinuities, and being adapted to be exposed to a corrosive environment;

means for applying ultrasonic pulses to said monitoring zone of said probe while the probe is exposed to the corrosive environment, for receiving the corresponding pulses reflected from said first and second discontinuities, and for converting the received pulses into corresponding electrical signals; and

signal processing means for determining the time delay intervals between the electrical signals corresponding to the pulses reflected from the first discontinuity and the electrical signals corresponding to pulses reflected from the second

discontinuity while the probe is exposed to the corrosive environment, and for providing an indication of the corro-



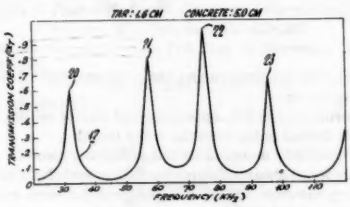
sion thickness on the monitoring zone of said probe based on said determination of the time delay intervals.

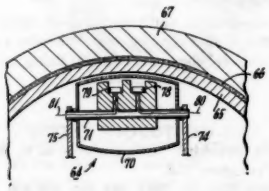
4,539,847

ACOUSTIC METHOD AND APPARATUS FOR MEASURING THICKNESS OF A COATING LAYER ON A SUBSTRATE

Hans J. Paap, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 3, 1984, Ser. No. 567,707
Int. Cl.[3] G01N *29/00*
U.S. Cl. 73—579 **13 Claims**





13. System for measuring thickness of a concrete coating on a subsea pipeline, comprising in combination

a first piezoelectric transducer adapted for transmitting a sweep of acoustic energy over a range of 20–120 KHz through the wall of said pipe and concrete coating into said sea,

a second piezoelectric transducer adapted for receiving said sweep of acoustic energy reflected from the boundaries of said pipe wall and concrete coating,

first circuit means for energizing said first transducer,

second circuit means for amplifying signals generated by said second transducer,

a variable frequency oscillator for generating a sweep of frequencies over said range of 20–120 KHz,

third circuit means for connecting the output of said oscillator to said first transducer,

means for measuring the amplitudes of said transmitted and received acoustic energies,

a microprocessor;

fourth circuit means for connecting said microprocessor to control said oscillator, and

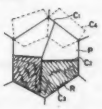
fifth circuit means for connecting said amplitude measuring means to said microprocessor whereby the ratio of said measured amplitudes over said range of frequencies is determined and the thickness of said concrete coating measured.

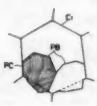
4,539,848

METHOD OF DETERMINING GRAIN SIZE USING ULTRASONIC WAVES

Hideo Takafuji, and Shoichi Sekiguchi, both of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 25, 1984, Ser. No. 634,478
Claims priority, application Japan, Aug. 1, 1983, 58-139390
Int. Cl.[3] G01N *29/00*
U.S. Cl. 73—599 **1 Claim**





1. A method of determining grain size using ultrasonic waves which comprises propagating ultrasonic waves having a frequency f through an object to be examined, determining the attenuation constant α of the ultrasonic waves, determining the order of the region j to which the value of f/α belongs using the ratio f/α and equation

$$C'_j \leqq f/\alpha \leqq C'_{j+1}$$

where C'_j and C'_{j+1} are constants and j is a constant between 1 and 4, and deriving the grain diameter D from equation

$$D = \left(\frac{\alpha}{A_j \cdot f^{n_j+1}} \right)^{\frac{1}{n_j}}$$

using an integer n_j and constant A_j predetermined for the order j of each region.

4,539,849

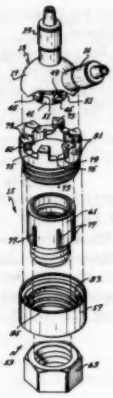
TRANSDUCER ASSEMBLY INCLUDING A DISPOSABLE DOME

Kelly Pike, Santa Ana, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Sep. 16, 1983, Ser. No. 532,684
Int. Cl.[3] G01L *7/08*
U.S. Cl. 73—715 **16 Claims**

1. A dome for attachment to a pressure transducer, said dome comprising:

a body having a recess therein which opens at the exterior of the body;
a flexible diaphragm;
means for mounting the diaphragm on the body with the diaphragm extending across the recess to form a chamber in the body;
said body having port means for providing communication through said body between the chamber and the exterior



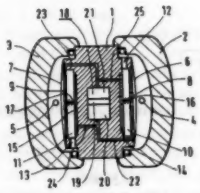
of the body whereby fluid can be admitted to said chamber;
a plurality of exposed, circumferentially spaced lugs extending generally radially outwardly from the exterior of the body for use in attaching the dome to the pressure transducer; and
said body having a shoulder on the exterior of the body spaced from the lugs to define an intermittent circumferentially extending groove which opens generally radially.

4,539,850

PRESSURE OR PRESSURE-DIFFERENCE MEASURING APPARATUS WITH A PRESSURE SENSOR DEVICE PROTECTED AGAINST OVERLOAD

Horst Ziegler, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 466,561
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1982, 3205826; Jun. 11, 1982, 3222620
Int. Cl.[3] G01L *13/02*
U.S. Cl. 73—706 **18 Claims**



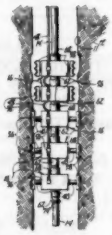
1. A differential pressure measuring apparatus comprising:
a central pickup body;
a measuring chamber, having a first and second subchamber;
a pressure sensor device disposed in said measuring chamber;
first and second separating diaphragms attached to said central pickup body and forming first and second antechambers between said first and second separating diaphragms and said central pickup body;
first and second connecting canals connecting said first and second subchambers to said first and second antechambers;
first and second supplementary diaphragms resting against the central pickup body with pre-tension, said first and second supplementary diaphragms being disposed in said first and second antechambers adjacent said first and second separating diaphragms, respectively, said supplementary diaphragms each being fastened to the central pickup body within the respective one of said antechambers; and
first and second single supplementary canals connecting said first and second connecting canals respectively to sides of said second and first supplementary diaphragms, opposite said second and frist separating diaphragms.

4,539,851

SOIL AND ROCK SHEAR TESTER

Alan J. Lutenegger, Potsdam, N.Y., assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 21, 1984, Ser. No. 612,708
Int. Cl.[3] G01N *3/24*
U.S. Cl. 73—845 **29 Claims**



1. A device for determining the shear strength of rock and soil, comprising:
anchoring means for supporting said device within a borehole drilled in the material being tested;
a shaft slidably mounted to said anchoring means;
a plurality of shearing units attached to said shaft, said units being movable within said borehole between a first retracted position and a second material-engaging expanded position, said shearing units applying progressively greater normal forces on the material being tested while in said expanded position; and
means for sequentially applying an axial force along said shaft to each of said shearing units whereby said shearing units successively shear the material being tested.

4,539,852

VIAL CAP TORQUE TESTER

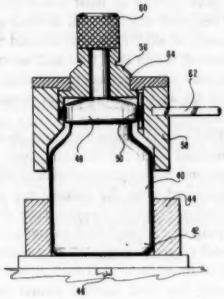
Jerome H. Feld, Brooklyn, N.Y., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 15, 1984, Ser. No. 589,800
Int. Cl.[3] G01N *3/22;* **G01L** *5/00*
U.S. Cl. 73—847 **3 Claims**

1. A device for testing the torque required to turn the cap of a sealed vial comprising:
(a) a base;
(b) torque gauge mounted on said base, said torque gauge including means for securely holding the base of a vial;
(c) means for releasably holding the cap of a vial, said means comprising a coil spring whose inside diameter is slightly smaller than the outside diameter of said cap when said spring is relaxed;

(d) a substantially cylindrical handle attached to one end of said spring;

(e) a substantially cylindrical housing attached to the other end of said spring, said cylindrical housing being concentric with said cylindrical handle whereby if said housing is turned relative to said handle in a direction opposite the direction in which said coil spring is wound, said coil



spring may be opened sufficiently to extend over said cap of said vial so that said coil spring will securely hold said cap of said vial when said housing and handle are released; and

(f) means for applying torque to said cap in in a direction which tends to close said coils of said coil spring such that said coil spring firmly holds said cap without slipping.

4,539,853

MAGNETIC FLOWMETER

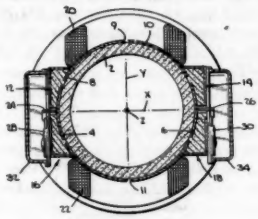
Eggert Appel, Dransfeld; Gottfried Geisler, Goettingen, and Wilfried Kiene, Hann-Muenden, all of Fed. Rep. of Germany, assignors to Fischer & Porter Company, Warminster, Pa.

Filed Jun. 27, 1984, Ser. No. 625,205

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337151

Int. Cl.³ G01F *1/58*

U.S. Cl. 73—861.12 **8 Claims**



1. A magnetic flowmeter comprising:

A. a spool formed of a metallizable ceramic through which is flowable the fluid to be metered;

B. a pair of metering electrodes metallized on the outer surface of the spool in the central region thereof at diametrically opposed positions on an electrode axis that is normal to the flow axis of the spool;

C. a pair of electromagnetic coils on the exterior of the spool at diametrically opposed positions on a coil axis that is normal both to the electrode axis and the flow axis to produce an electromagnetic field in the spool which is intercepted by the fluid to induce an emf therein to produce a signal at the metering electrodes which is a function of flow rate; and

D. a block of metallizable ceramic overlying each metering electrode and projecting from the spool, the outer surface of said block being metallized to define a shield electrode which covers the metering electrode.

4,539,854

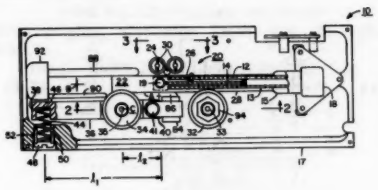
FRICTION DRIVE FOR METERING DEVICE

Randolph F. Bradshaw, Avon, and Glen A. Carey, North Ridgeville, both of Ohio, assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 13, 1983, Ser. No. 541,511

Int. Cl.³ B01L *3/02*; G01N *1/14*

U.S. Cl. 73—864.18 **14 Claims**



1. In a fluid metering system, wherein a plunger actuated syringe is mounted in a housing and is coupled to at least one source of fluid, a highly accurate and precise linear friction drive mounted in the housing and coupled to the plunger comprising: a rack, having a flat side; a rotatable pinion pressed against the flat side of the rack for moving the rack by friction; opposed guide rollers, one of which is fixed relative to the housing, engaging a portion of the rack opposite the flat side in straddling relation with the pinion for urging the rack intimately thereagainst; a moveable swing arm having one end mounted for rotatable motion about a point and moveably supporting the other of the guide rollers against the rack; a force exerting means operating at a free end of the swing arm for leveraging the guide roller carried by the swing arm against the rack and transmitting the force to the pinion; and means for securing the swing arm in a plane perpendicular to the flat side of the rack, preventing lateral motion of the swing arm from being transmitted to the rack and pinion, for suppressing cyclical variation in the relative motion between the same.

10. An accurate and precise linear friction drive comprising: a housing; a rack, having a flat side; a rotatable pinion pressed against the flat side of the rack for moving the rack by friction; opposed guide rollers, one of which is fixed relative to the housing, engaging a portion of the rack opposite the flat side in straddling relation with the pinion for urging the rack intimately thereagainst; a moveable swing arm having one end mounted for rotatable motion about a point and moveably supporting the other of the guide rollers against the rack; a force exerting means operating at a free end of the swing arm for leveraging the guide roller carried by the swing arm against the rack and transmitting the force to the pinion; and means for securing the swing arm in a plane perpendicular to the flat side of the rack, preventing lateral motion of the swing arm from being transmitted to the rack and pinion, for suppressing cyclical variation in the relative motion between the same.

4,539,855

APPARATUS FOR TRANSFERRING LIQUID OUT OF A CAPPED CONTAINER, AND ANALYZER UTILIZING SAME

Merrit N. Jacobs, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1984, Ser. No. 606,489

Int. Cl.³ G01N *35/06*

U.S. Cl. 73—864.25 **6 Claims**

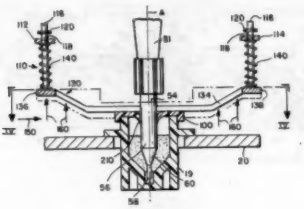
1. In apparatus for measuring the concentration of analytes in a liquid deposited onto a test element, such liquid being

drawn from a quantity in a container covered by a pierceable cap, the apparatus comprising

means for aspirating such liquid from said container into a storage unit constructed to receive and dispense such liquid,

means for moving said unit: (i) from a location outside of the container, into an aspirating position in which such cap is pierced by such storage unit and said unit is immersed in the liquid in such container, and (ii) away from said aspirating position,

stripping means for stripping the pierced cap off the storage unit,



means for dispensing at least a fraction of such liquid out of the storage unit onto such test elements,

and means for detecting a change in such test element that is indicative of the amount of such analytes present in the liquid,

the improvement wherein said stripping means includes means for holding such container during the entire movement of said storage unit away from said aspirating position therein, to prevent non-uniform relative movement between the storage unit and the container such as could cause perfusion during subsequent dispensing.

4,539,856

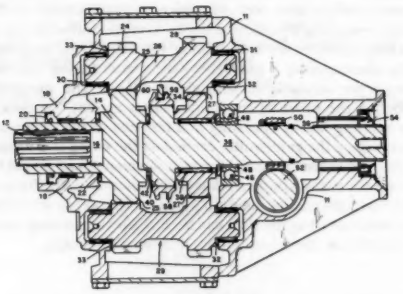
TWO-SPEED AUXILIARY TRANSMISSION

Barry L. Frost, Arrington, Tenn., assignor to Doug Nash Equipment & Engineering, Franklin, Tenn.

Filed Sep. 23, 1983, Ser. No. 535,380

Int. Cl.[3] F16H *3/08*

U.S. Cl. 74—363 **9 Claims**



1. An auxiliary power transmission having a first power shaft and a second power shaft, comprising:

a transmission housing dimensioned to house and support the auxiliary power transmission;

a first main bearing in said housing for rotatably supporting said first power shaft;

a second main bearing in said housing for rotatably supporting said second power shaft;

a first sun gear for being rotatably interconnected with the first power shaft;

a second sun gear for being rotatably interconnected with the second power shaft, the first and second sun gears having differing diameters;

a shift mechanism for mechanically interconnecting the first and second power shafts and for shifting between engagement with the first sun gear and the second sun gear;

said first sun gear having at least three teeth aligned with three teeth, respectively, on said second sun gear;

said aligned teeth of said first and second sun gears being unequally spaced about said first and second sun gears to form at least one space between said aligned teeth that is large relative to at least one other space between said aligned teeth;

at least three first planet gears disposed about and continuously intermeshed with the first sun gear;

at least three second planet gears disposed about and continuously intermeshed with the second sun gear;

at least three countershafts having two ends, each shaft fixedly carrying one of said first planet gears on one of its ends and fixedly carrying one of said second planet gears on the other of its ends so that said at least three countershafts and said first and second planet gears carried by each of said shafts form at least three planet gear sets that transmit power between the first and second sun gears, each of said planet gear sets having at least one tooth space of said first planet gear aligned with a tooth space of said second planet gear;

a plurality of countershaft bearings in said housing for rotatably supporting said countershafts; and

said planet gear sets being positioned about said sun gears so that said aligned tooth spaces of said planet gears receive and engage said aligned teeth of said sun gears, whereby said planet gear sets are unequally spaced apart, one from the other, about the first and second sun gears to form at least one space between said planet gear sets that is large relative to at least one of the other spaces between said planet gear sets.

4,539,857

RACK-AND-PINION TYPE STEERING GEAR

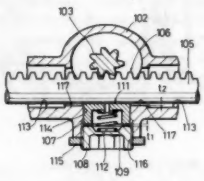
Hiroyoshi Kako, Aichi; Nobuo Kobayashi; Iwao Tanimoto, both of Toyota, and Shigeo Aiba, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 12, 1983, Ser. No. 531,251

Claims priority, application Japan, Nov. 30, 1982, 57-210863

Int. Cl.[3] F16H *1/04;* B62D *1/20, 5/06*

U.S. Cl. 74—422 **4 Claims**



1. A rack-and-pinion type steering gear comprising a rack housing, a pinion inserted into said rack housing and adapted to rotate in cooperation with rotation of a steering wheel, a rack bar having rack teeth normally meshed with said pinion and adapted to move reciprocatingly in an insert hole formed in said rack housing in association with rotation of said pinion, a rack guide hole formed in said rack housing and on the opposite side to the meshed position of said pinion and said rack teeth, a rack guide made of a low-rigid material inserted into said rack guide hole and abutting against a back side surface of said rack bar to guide the reciprocating motion of said rack bar, a set bolt screwed into said rack guide hole from a rear side

of said rack guide and adapted to restrict the regressive stroke of said rack guide, a spring interposed between said set bolt and said rack guide and adapted to urge said rack guide at a predetermined force toward the rear side surface of said rack bar, and a rack bar abutting portion projecting from the inner surface of said insert hole at the circumference of said rack guide hole of said rack housing and opposed to the rear side surface of sdid rack bar, a clearance larger than a regressive limit and smaller than an elastic deformation limit of said rack guide being defined between the back side surface of said rack bar and said rack bar abutting portion.

4,539,858

SHIFT CONTROL MECHANISM OF AN AUTOMOTIVE MANUAL TRANSMISSION

Kotei Takahashi, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Japan

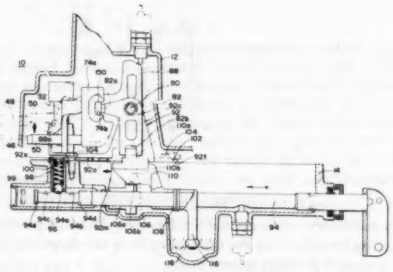
Filed Feb. 19, 1982, Ser. No. 350,391

Claims priority, application Japan, Feb. 20, 1981, 56-22884

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.³ B60K *20/00*

U.S. Cl. 74—475 **8 Claims**



1. In a shift control mechanism of an automotive manual transmission including shift forks slidable along a fork shaft for shifting corresponding coupling sleeves, a control rod rotatable about and slidable along the axis thereof which is normal to the axis of said fork shaft, a pivoting pin extending normal to both the axes of said fork shaft and said control rod, at least one pivoting lever pivotally mounted on said pivoting pin and jointly engaged at one end thereof with an associated shift fork to induce, upon rotation about the pivoting pin, a sliding movement of the associated shift fork along the fork shaft, a selecting head member secured to said control rod to be movable therewith, said head member being engageable with the other end of said pivoting lever when said control rod rotates about the axis thereof into a certain angular position, an interlock plate mounted on said control rod for rotation therewith to ensure that only the selected pivoting lever is rotatable at any given time, means for temporarily restraining said control rod in one longitudinal position thereof, said means including longitudinally spaced notches formed on said control rod and an engaging member biased to slidably engage with said notches, said engaging member being received in a hole formed in the transmission housing, and a supporting member removably secured to said transmission housing and having mounted thereon said pivoting pin,

a positioning arrangement for positioning parts of said transmission relative to the transmission housing, said arrangement comprising:

a first projection formed on said supporting member, said projection being tightly received in a hole of said transmission housing;

a second projection formed on one of said supporting member and said transmission housing; and

said second projection being tightly received in another hole formed in the other of said supporting member and said transmission housing, whereby when said first and second projections are both tightly received in the corresponding holes, displacement of said supporting member relative to said transmission housing in a direction normal to the axes of said first and second projections is prevented.

4,539,859

SHIFT MECHANISM IN A MANUAL TRANSMISSION

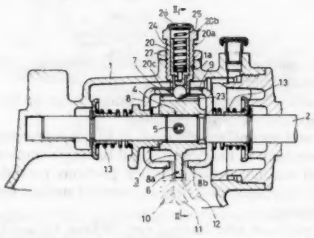
Hajime Arai, Aichi; Shozi Haga, and Tadashi Nozaki, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 22, 1982, Ser. No. 421,436

Claims priority, application Japan, Oct. 20, 1981, 56-156721[U]

Int. Cl.³ B60K *20/00*; **G05G** *5/10, 9/02, 5/06*

U.S. Cl. 74—475 **2 Claims**



1. In combination with a manual transmission for an automobile having a transmission casing, a shift-and-select lever shaft mounted on said transmission casing so as to move axially and rotate about its axis, a shift-and-select lever fixed to said shift-and-select lever shaft and provided with an engagement portion at its lower end for engaging with shift heads which can take two shift positions and a neutral position and provided with detent grooves at its upper end, a detent mechanism comprising:

a cylindrical holder provided with an opening at its one end and removably mounted on said transmission casing such that said opening is directed towards said detent grooves;

a detent ball accommodated in said holder at said opening and having a diameter greater than an inner diameter of said opening, said detent ball being in tangential contact with said holder and adapted to engage with one of said detent grooves for determining a shift position of said shift heads, said opening being provided with a ball retaining portion comprising an inwardly bent circumferential edge of said holder at said opening for allowing a part of said detent ball to project from said opening while preventing said detent ball from coming out from said opening, and said holder being installed in said transmission casing in such a manner that said detent ball is slightly lifted from said ball retaining portion when said detent ball is brought into contact with one of said detent grooves of said shift-and-select lever;

a compression spring accommodated in said holder and adapted to bias said detent ball against said detent grooves; and

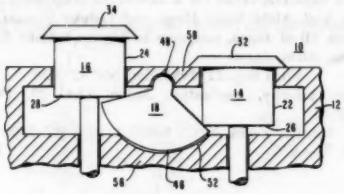
a spring seat disposed within said holder for receiving a resilient force of said compression spring, said spring seat being slidable in and abuttable at its lowermost position against said holder in such a manner that when said detent ball engages with said detent grooves of said shift-and-select lever, said spring seat is in its lowermost position and said detent ball engages the lowermost end of said spring seat without receiving the resilient force of said compression spring.

4,539,860

PUSHBUTTON INTERLOCK

Robert J. Johnston, Patterson Heights; Stephen G. Layciak, Brighton Township, Beaver County, and Dominic Colista, Ambridge, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 26, 1983, Ser. No. 526,713
Int. Cl.³ G05G *11/00*
U.S. Cl. 74—483 PB **2 Claims**



1. A manually operated switch assembly with interlock mechanism, comprising:

a housing having first and second arcuate surface portions at oppositely facing positions;

first and second pushbuttons within the housing;

an interlock in the housing and having complementary first and second arcuate surface portions rotatably engaging the corresponding first and second surface portions of the housing;

the interlock also having one surface engaged by the first pushbutton and another surface engaged by the second pushbutton; and

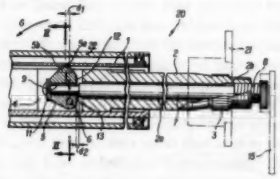
the interlock being rotatable within and between the complementary first and second arcuate surface portions in response to activation of the first pushbutton to block actuation of the other pushbutton.

4,539,861

REGULATING APPARATUS FOR A STEERING SHAFT

Masumi Nishikawa, Toyoake, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 4, 1983, Ser. No. 472,209
Claims priority, application Japan, Mar. 9, 1982, 57-36768
Int. Cl.³ B62D *1/18*; G05G *5/16*
U.S. Cl. 74—493 **6 Claims**



1. A regulating apparatus for a steering shaft of a steering wheel, comprising:

an outer shaft rotatably mounted on a casing member;

an inner shaft axially slidably mounted within said outer shaft and rotatable for transmitting torque generated by rotation of said steering wheel wherein said steering wheel is mounted on said inner shaft;

a locking member axially slidably mounted within said outer shaft and pivotably mounted on said inner shaft for selective engagement with said outer shaft; and

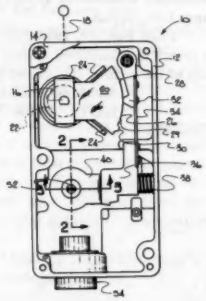
a control rod operatively connected to said inner shaft and said locking member for rotating said locking member so as to pressingly engage said locking member against said outer shaft wherein said locking member is pressed against said outer shaft at a point axially forwardly offset from a point where said locking member is pivotably mounted on said inner shaft and wherein said control rod and said locking member have a clearance formed therebetween such that upon an axial force being applied to said control rod, said control rod is slidable within said outer shaft and said engagement of said locking member with said outer shaft is increased.

4,539,862

DETENT HOLD AND RELEASE MECHANISM

Patrick N. Caldwell, Tucson, Ariz., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Dec. 4, 1981, Ser. No. 327,382
Int. Cl.³ G05G *5/18*; F16K *31/46*; F16D *27/01*
U.S. Cl. 74—527 **5 Claims**



1. A detent hold and release mechanism for use on a manually positioned valve controller, having a detented position and a spring for returning the controller from the detented position to a neutral position comprising:

a manually positioned rotating controller handle;

an arcuate contact surface connected to the controller handle;

detent means on the arcuate surface;

a detent locking pawl pivotally mounted on the controller with the pawl engaging surface located approximate the outer end of the pawl and the pawl being urged against the arcuate surface for engaging the detent means and holding the controller handle in a detented position;

a spring arm connected to the outer end of the pawl forming an extension thereof and a contact plate attached to the free end of the spring arm;

a permanent magnet means having a pair of pole pieces engaging the contact plate for holding the locking pawl against the detent means in the detented position; and

an electro-magnet means positioned adjacent the permanent magnet providing, when energized, a reverse magnetic field to substantially cancel the field produced by the permanent magnet and release the locking pawl on the controller and allow the biased controller to return to a neutral position.

4,539,863

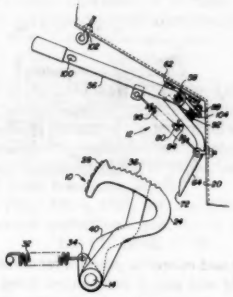
DUAL BRAKE PEDAL LOCK MECHANISM

Donald C. Kaukaskie, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 18, 1983, Ser. No. 553,018
Int. Cl.³ G05G *5/20*
U.S. Cl. 74—540 **5 Claims**

1. In a combination including a pair of brake pedals mounted in side-by-side relationship to each other for pivotal movement between brake-release and brake-engage positions and each including an arm provided with a rack of teeth, and a pedal lock mechanism including a pair of lock members pivotally

mounted for selective movement between pedal-release positions wherein they are free of said rack of teeth and pedal lock positions wherein they engage said rack of teeth for locking said brake pedals in their brake-engage positions, an improved pedal lock mechanism, comprising: a pivotally mounted shaft movable between first and second positions corresponding to said pedal-release and pedal-lock positions; first and second connection means respectivley connecting said pair of lock



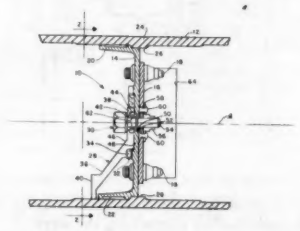
members to said shaft for pivotal movement therewith and for limited swivel movement relative thereto and to each other; said first and second connection means respectively including first and second biasing means acting between the shaft and said pair of lock members and urging the latter toward their pedal-lock positions for thereby establishing a pair of one-way resilient connections permitting the pedals to be either independently or simultaneously locked in and simultaneously released from their brake-engage positions.

4,539,864

ADJUSTABLE BALANCE WEIGHT FOR ROTATING SHAFT

David J. Wiebe, Palm Beach Gardens, Fla., assignor to The United States of America as represented by the United States Secretary of the Air Force, Washington, D.C.

Filed Jun. 29, 1982, Ser. No. 393,267
Int. Cl.³ F16F *15/32*
U.S. Cl. 74—573 R **4 Claims**



1. A balance weight mechanism attached to a tubular engine shaft for correcting unbalance in the engine, comprising:

(a) a stiffener plate mounted within said tubular shaft transversely to the rotational axis of said shaft;

(b) a balance weight arm;

(c) a fastener for releasably fastening an end of said balance weight arm to a generally central location on said stiffener plate where said axis of rotation of said shaft intersects said plate;

(d) an annular face spline ring on said stiffener plate encircling and radially displaced from said central location thereon; and

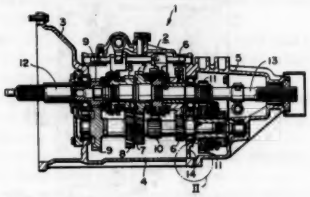
(e) spline teeth on said balance weight arm facing toward said stiffener plate and aligned to intermesh with an arc of said annular spline ring on said stiffener plate for holding said balance weight arm in a desired angularly adjusted position extending outwardly radially from said axis of rotation of said shaft.

4,539,865

TRANSMISSION HOUSING ARRANGEMENT

Tetsuzo Yoneda, Toyota, and Masanori Sato, Nagoya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Jul. 6, 1982, Ser. No. 395,709
Claims priority, application Japan, Jul. 13, 1981, 56-103563[U]
Int. Cl.³ F16H *57/04*
U.S. Cl. 74—606 R **2 Claims**



1. A transmission housing arrangement for accommodating a plurality of meshing gears comprising:

a main housing accommodating at least one of said plurality of meshing gears;

an extension housing connected to said main housing and accommodating the remainder of said plurality of meshing gears;

an intermediate plate partitioning said extension housing and said main housing, said intermediate plate having a vertical plane and defining a through hole at a lower portion thereof, said through hole establishing fluid communication between said extension housing and said main housing;

a bottom wall defined by said extension housing, said bottom wall defining a recess having a first surface and a second surface, said first surface being elevated with respect to said second surface, a first end of said first surface being connected to a first end of said second surface, a second end of said first surface and a second end of said second surface facing said intermediate plate, said through hole and said recess defining an oil passage;

a substantially vertical plane through said second end of said first surface and said second end of said second surface being closer to the vertical plane of said intermediate plate than any vertical plane through said remainder of said plurality of meshing gears;

whereby said first surface restricts fluid flow to the vicinity of said remainder of said plurality of meshing gears, thereby minimizing sweeping up of lubricant from said remainder of said plurality of meshing gears.

4,539,866

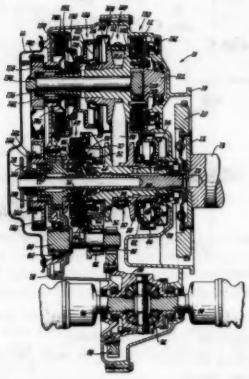
CONTINUOUSLY VARIABLE TRANSMISSION

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1983, Ser. No. 548,325
Int. Cl.³ F16H *37/06*
U.S. Cl. 74—665 GE **3 Claims**

3. A continuously variable power transmission comprising: an input means; an output means; variable ratio pulley and belt means operatively connectible between said input means and said output means and including a first adjustable pulley means,

second adjustable pulley means including forwardreverse drive selection means operatively connectible with a flexible drive member interconnecting said pulleys; first selectively engageable clutch means for connecting said first pulley means to said input means during a first variable speed ratio range; second clutch means being selectively engageable for connecting said second pulley means to said output means during the first variable ratio range; and a transitional clutch being selectively engageable independently of said first and second clutch means for connecting said input means to said output means to transmit torque therebetween during the change from the first variable ratio range to a second variable ratio range, said first



clutch means being shiftable for connecting said first pulley to said output means during engagement of said transition clutch for operation of said second variable ratio range, said second clutch means being shiftable for selectively connecting the second pulley to said input means during engagement of said transition clutch for operation during said second variable ratio range, and said variable ratio pulley means being controlled to provide a change in ratio from said first pulley means to said second pulley means from an underdrive to an overdrive during said first variable ratio range and to provide a change in ratio from said second pulley means to said first pulley means between an underdrive and an overdrive during said second variable ratio range.

4,539,867

STEPLESS TRANSMISSION GEAR SYSTEM FOR AUTOMOBILES

Bunichi Ishimi, 5-15, 2-chome, Shinmori, Asahi-ku, Osaka, Japan

Filed Nov. 2, 1983, Ser. No. 548,138
Claims priority, application Japan, Jul. 1, 1983, 58-120621
Int. Cl.³ F16H *3/44, 57/10, 1/28*
U.S. Cl. 74—793 **8 Claims**

1. A stepless transmission gear system for automobiles comprising:

a casing;

an input shaft coupled to an external driving source and rotatably mounted in said casing at one end thereof;

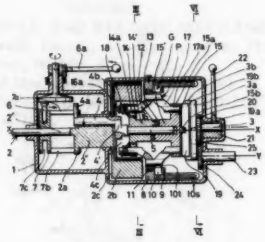
an output shaft rotatably mounted in said casing at the other end thereof substantially in axial alignment with said input shaft;

a crankshaft rotatably and eccentrically supported by said input shaft so as to revolve around the axis of said input shaft as the latter is driven, said crankshaft having a crank pin disposed substantially between said input and output shafts in said casing and in axial alignment therewith when the transmission gear system is in the neutral position thereof;

a shifter means operable from outside of said casing for turning said crankshaft around own axis thereof through an angle determined by the position of said shifter means to swing said crank pin therearound to a corresponding eccentric position off said axis;

a stationary internal gear means secured to the inner wall of said casing coaxially with said input shaft;

a variable-diameter pinion mechanism rotatably mounted on said crank pin and meshing with said internal gear means so as to make a planetary motion around said axis as said crank



pin brought to said eccentric position revolves therearound, the diameter of said pinion mechanism being continuously variable with the eccentricity of said crank pin off said axis; and

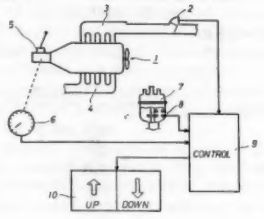
a coupling means for transmitting the rotation of said pinion mechanism to said output shaft when said pinion mechanism is making a planetary motion about said axis of said input shaft.

4,539,868

METHOD AND APPARATUS FOR OPTIMIZED GEAR SHIFTING INDICATION

Nobuo Habu, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 11, 1983, Ser. No. 474,325
Claims priority, application Japan, Jun. 4, 1982, 57-96841
Int. Cl.³ B60K *41/08;* **G07C** *5/08;* **G09B** *19/16;* **B60Q** *1/00*
U.S. Cl. 74—864 **17 Claims**



1. A method for indicating gear shifting operation for a vehicle transmission, comprising the steps of;

calculating current engine load Q/N from the intake air flow Q and the engine speed N;

comparing said current engine load thus calculated with a predetermined engine load constant;

re-starting at the first step of the method if said comparison finds said current engine load less than or equal to said predetermined constant;

calculating current shift position from current engine speed N, current vehicle speed V and the known transmission gear ratio;

determining a first engine load operation function Y=f (N) and a second operating engine load function B=g (N) from known equal fuel consumption rate curves;

comparing said first operating load operation function Y with said current engine load Q/N;

indicating a shift-down operation to be performed if said first function has a value greater than said current engine load Q/N;

performing additional steps for potential shift-up operation indication if said first function has a value less than or equal to said current engine load Q/N; calculating current engine horsepower PS from said current engine speed N and current engine load Q/N; and

calculating expected engine speed N′ necessary for maintaining said current car speed V if there is a one shift-up operation performed on said transmission.

4,539,869

LOCK-UP CONTROL SYSTEM FOR LOCK-UP TYPE AUTOMATIC TRANSMISSION

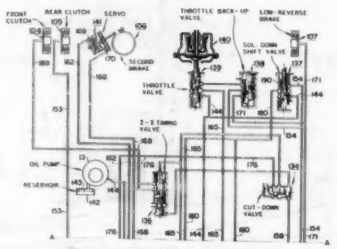
Masaaki Suga, Yokohama; Yoshiro Morimoto, Yokosuka; Hideo Hamada, Yokosuka; Masaaki Futagi, Yokosuka, and Tadashi Suzuki, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

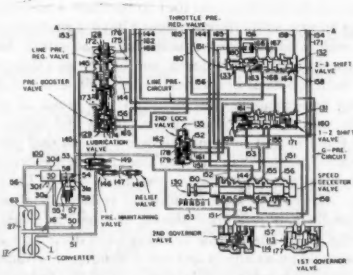
Filed Jul. 6, 1981, Ser. No. 280,818

Claims priority, application Japan, Jul. 7, 1980, 55-91639

Int. Cl.³ B60K *41/18*

U.S. Cl. 74—866 **12 Claims**





12. A lock-up control system for a lock-up type automatic transmission of an automotive vehicle having an engine, the transmission including a torque converter with a lock-up clutch and a hydraulic control system having a plurality of shift valves including a first shift valve and a second shift valve, each of the shift valves including a spool movable between an upshift position thereof and a downshift position thereof, the torque converter being shiftable into a lock-up state wherein the lock-up clutch is engaged or a torque converter state wherein the lock-up clutch is released, the lock-up control system comprising:

means for determining whether the vehicle is operating in a predetermined lock-up range and generating a lock-up permission signal when the vehicle is operating in said predetermined lock-up range;

means for generating a first load indicative signal when a load imposed on the engine satisfies a first predetermined condition;

means for generating a second load indicative signal when the load imposed on the engine satisfies a second predetermined load condition;

a first shift switch mounted on the first shift valve, said first shift switch being responsive to movement of the spool of said first shift valve;

a second shift switch mounted on said second shift valve, said second shift switch being responsive to movement of the spool of the second shift switch;

a first edge trigger circuit means coupled with said first shift switch to be triggered thereby for generating a first signal having a first time duration;

a second edge trigger circuit means coupled with said second shift switch to be triggered thereby for generating a second signal having a second time duration;

a first gate means having inputs coupled with said first and second edge trigger circuit means, respectively, for receiving said first and second signals, said gate means delivering a first output signal when one of said first and second signals is present;

a third edge trigger circuit means coupled with said first shift switch to be triggered thereby for generating a third signal having a third time duration;

a fourth edge trigger circuit means coupled with said second shift switch to be triggered thereby for generating a fourth signal having a fourth time duration,

said first, second, third and fourth time durations being different from each other;

a second gate means having inputs coupled with said third and fourth edge trigger circuit means, respectively, for receiving said third and fourth signals, said gate means delivering a second output signal when one of said third and fourth signals is present;

a third gate means having inputs coupled with said first gate means and said first load indicative signal generating means for delivering a third output signal when said first output signal and said first indicative load signal are present;

a fourth gate means having inputs coupled with said second gate means and said second load indicative signal generating means for delivering a fourth output signal when said second output signal and said second load indicative signal are present;

a fifth gate means having inputs coupled with said third and fourth gate means for delivering a gear shift signal when one of said third and fourth output signals delivered by said third and fourth gate means is present; and

means responsive to said lock-up permission signal and said gear shift signal delivered by said fifth gate means for engaging the lock-up clutch when said lock-up permission signal is present and said gear shift signal is absent and for temporarily disengaging the lock-up clutch for operation in the torque converter state as long as said gear shift signal is present even when said lock-up permission signal is present.

4,539,870

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Kazuhiko Sugano, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 29, 1983, Ser. No. 518,540

Int. Cl.³ F16H *47/00*

U.S. Cl. 74—869 **1 Claim**

1. In an automatic transmission:

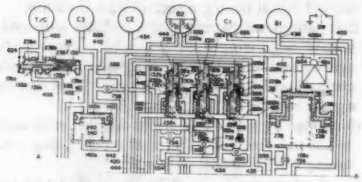
a plurality of fluid operated friction units which are selectively made operative and inoperative to establish, in a forward drive range, a plurality of forward speed ratios including a highest speed ratio and other forward speed ratios, said plurality of fluid operated friction units including a fluid operated clutch which is to be engaged when the transmission downshifts from the highest speed ratio to any one of the other forward speed ratios and when the

transmission shifts from a neutral position to the forward drive range;

a source of fluid pressure;

means, including a fluid conduit communicating with said fluid operated clutch, for supplying the fluid pressure from said source of fluid pressure to said fluid operated clutch through said fluid conduit when any one of the other forward speed ratios is established;

a pressure accumulator including a bore, a fluid operated piston movably disposed in said bore to form within said bore a first chamber on one side of said piston and a second chamber on an opposite side of said piston, and a spring disposed in said second chamber biasing said piston



in a first direction, said first chamber communicating with said source of fluid pressure, said second chamber communicating with said fluid conduit,

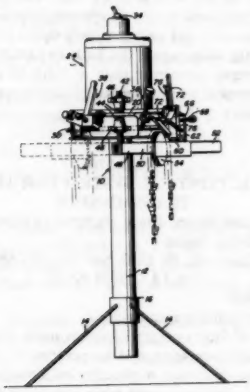
said piston being urged to move by said spring when said second chamber is supplied with the fluid pressure from said fluid conduit with said first chamber being supplied with the fluid pressure from said source of fluid pressure when said fluid operated clutch is to be engaged when the transmission downshifts from the highest speed ratio to any one of the other forward speed ratios or when the transmission shifts from the neutral position to the forward drive range in order to retard a rise in fluid pressure supplied to said fluid operated clutch through said fluid conduit.

4,539,871

SAW CHAIN SHARPENER

Jack F. Simington, Chiloquin, Oreg., assignor to Simington Products Co., Chiloquin, Oreg.

Filed Oct. 18, 1974, Ser. No. 516,129
Int. Cl.[3] B23D *63/16*; B24B *9/00*
U.S. Cl. 76—42 **13 Claims**



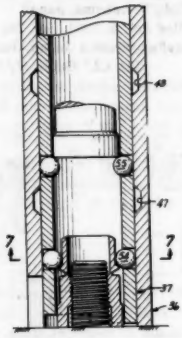
8. A chain saw sharpener, said sharpener including a rotary grinding member, support means for supporting a length of saw chain, means guidingly supporting said support means for oscillation, relative to the axis of rotation of said rotary grinding member, along a path of movement of predetermined extent, said path including opposite end portions directed at their terminal ends, inwardly toward the axis of rotation of said grinding member from positions along said path spaced outwardly of corresponding opposite side portions of the grinding member.

4,539,872

TOOL FOR SUPPLYING AND DRIVING A SEQUENCE OF THREADED FASTENERS

Harry L. Bochman, Jr., Seal Beach, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Nov. 24, 1982, Ser. No. 444,178
Int. Cl.[3] B25B *23/02*
U.S. Cl. 81—57.37 **8 Claims**



1. A tool for driving a threaded fastener having a central axis, wherein said fastener includes an axially-extending array of driving surfaces that have a smaller envelope than the largest part of the fastener, said tool comprising: a reference sleeve having an axis, said reference sleeve having an axial cylindrical inner wall; a tubular drive spindle having an axis co-linear with the axis of the reference sleeve, and having an axial cylindrical inner wall, co-axial cylindrical outer wall, and a radially extending ball-retaining port between said walls of said drive spindle, said drive spindle being rotatably and axially reciprocably fitted in said reference sleeve; a ball in said port having a diameter greater than the wall thickness of the drive spindle; a peripheral groove formed in the inner wall of the reference sleeve, whereby, as a function of the relative axial position of the spindle and reference sleeve, the ball is either pressed inwardly inside the spindle to engage and drive said array of a fastener held co-axially in said drive spindle, or withdrawn into the groove to permit said largest part of the fastener to pass, and for said fastener to rotate freely relative to said drive spindle; and metering means axially restraining a fastener in the spindle and adapted to permit the passage of fasteners one-by-one, said reference sleeve and spindle being adapted to be mounted to a tool, said tool including power means to rotate said drive spindle around its axis.

4,539,873

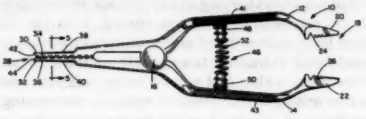
PRYER-PLIER TOOL

Melvyn N. Freed, 17023 Magnolia Dr., Hazel Crest, Ill. 60429

Filed Nov. 30, 1983, Ser. No. 556,406
Int. Cl.[3] B25B *7/02*
U.S. Cl. 81—311 **9 Claims**

1. A multi-use tool comprising a pair of links pivoted to one another by pivot means intermediate the ends, cooperating inwardly facing jaw means adjacent one end of the links, the jaw means having opposed teeth operative to grip an object

when moved toward one another, cooperating separation jaws adjacent the opposite end of the links from the jaw means, the separation jaws being elongated and having chisel-like configurations at the outer ends, the separation jaws being adapted to abut one another, spring means for biasing the jaw means apart



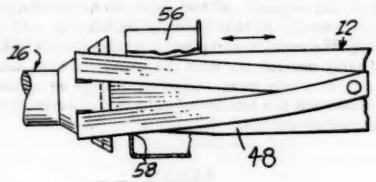
and the separation jaws together, and handle means defined on each link between the jaw means and the pivot means, whereby squeezing of the handle means will move the jaw means toward one another and the separation jaws away from one another.

4,539,874

TOOL DRIVER AND FASTENER APPARATUS

Bernard Jacovitz, 2100 S. Ocean La., Fort Lauderdale, Fla. 33316

Filed Mar. 9, 1984, Ser. No. 587,891
Int. Cl.³ B25B *23/10*
U.S. Cl. 81—454 **6 Claims**



1. The combination of a fastener and a tool driver comprising:

an elongated body extending along a longitudinal center line;

a handle connected at one end of said body,

a first blade means at the other end of said body,

said first blade in one plane containing the longitudinal center line,

at least two second blade means, each said second blade means having a generally linear edge portion in a plane, each said plane positioned generally transverse to the longitudinal center line,

each said second blade means including a planer portion connected to said elongate body,

said fastener including an elongae shaft extending generally along said longitudinal center line, said shaft having fastening means,

a head located at one end of said shaft, said head including a base portion abuttingly attached to said one end of said shaft, and a face portion at the distal end of said face portion,

said face portion of said head having a normal face slot means for receiving said first blade means of said driver, said normal face slot means positioned in a plane containing the longitudinal center line, said slot includes two generally parallel sides extending toward said shaft,

said fastener further including at least two second slot means undercutting said face portion of said head, each said two second slot means being disposed transverse to the center line of said shaft, each said second slot means being disposed generally parallel to the other, and both said second slot means generally perpendicular to said normal face slot,

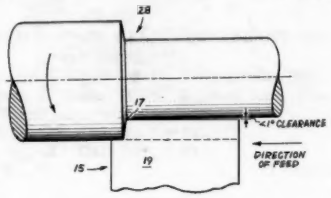
said first blade means constructed and arranged to mate in said normal face slot means for driving said fastener into and out of a connecting location in coplanar contact with said sides of said normal face slot means, and each said second blade means constructed and arranged to mate in a respective one of said second slot means by insertion of each said linear edge portion of each said second blade means into said respective one of said second slot means to prevent separation of said first blade from said normal face slot of said fastener and to allow movement of the fastener to and from the connecting location with the user holding only said handle, each said linear edge portion being disposed parallel to the other, and both said linear edge portions being generally perpendicular to said first blade means.

4,539,875

HIGH-SPEED METAL CUTTING METHOD AND SELF-SHARPENING TOOL CONSTRUCTIONS AND ARRANGEMENTS IMPLEMENTING SAME

Minyoung Lee; William R. Reed, Jr., both of Schenectady, and Lawrence E. Szala, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 221,078, Dec. 29, 1980, abandoned. This application Dec. 16, 1981, Ser. No. 331,341
Int. Cl.³ B23B *1/00;* **B26D** *1/00*
U.S. Cl. 82—1 C **31 Claims**



1. The high-speed, metal cutting method which comprises the steps of:

(a) providing and rigidly mounting a cutting tool adjacent a metal workpiece, said cutting tool having as part thereof a cantilevered longitudinally-extending cutting element at least ¼ inch in length, having a thickness dimension in the range of from 20 mils to 80 mils, being substantially uniform in transverse cross-section along its length and having a flank face and a rake face with said flank face being a substantially uniform distance in the range of from 20 mils to 80 mils from any support for said cutting element;

(b) causing relative rotation to occur between said cutting element and said workpiece;

(c) bringing the leading end of said cutting element against said workpiece;

(d) providing a clearance angle of about one degree or less between said flank face and said workpiece thereby having the trailing end of said cutting element out of contact with said workpiece and

(e) advancing said tool and maintaining contact between the leading end of said cutting element and said workpiece as metal is removed from said workpiece during the relative rotation and said cutting element is consumed along the length thereof with a new leading end being generated as wear occurs.

19. In a cutting tool arrangement in which a tool insert of refractory material is rigidly held in a tool holder, said tool holder being adapted to bring said tool insert into contact with a metal workpiece to alter the shape thereof by the removal of metal therefrom, the improvement wherein the tool insert is a flat plate of substantially uniform thickness in the range of from 20 mils to 80 mils, said plate being fixedly disposed on a sepa-

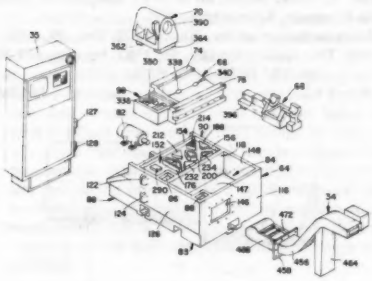
rate support therefor in overhanging relationship therewith to define a cutting element portion of said plate having a flank face of said cutting element portion located a substantially uniform thickness in the range of from 20 mils to 80 mils from said support, said flank face being defined at its upper extremity by a sharp edge, said cutting element portion being at least ¼ inch in length with the thickness of said cutting element being in the range of from 20 mils to 80 mils whereby during use as tool wear occurs consuming said cutting element along its length, new edges are generated on said cutting element at the leading end thereof where the cutting element consumption occurs and new short lengths of said sharp edge are exposed, a new edge together with a newly exposed short length become the leading end of said cutting element.

4,539,876

MACHINE TOOL

Carl J. Myers, Mentor, and Richard O. Ratzel, Westlake, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Oct. 11, 1983, Ser. No. 540,959
Int. Cl.³ B23B *17/00*
U.S. Cl. 82—32 **12 Claims**



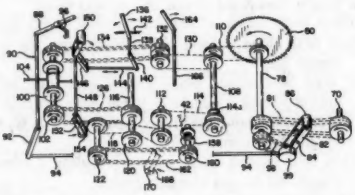
1. A machine tool comprising a one-piece cast base having side walls which define a tank to hold coolant during operation of said machine tool, said base including a wayblock mounting section disposed adjacent to one end of said tank, said wayblock mounting section including surface means for defining an upwardly opening first basin having a bottom and a rim extending upwardly from and around the periphery of the bottom of said first basin, said wayblock mounting section further including a plurality of projections extending upwardly from the bottom of said first basin, said projections having a plurality of upwardly extending as cast surface areas disposed within said first basin at locations spaced from the rim of said first basin with some of said surface areas extending transversely to other of said surface areas, a cast wayblock having an upper side portion with a track for engaging a tool support carriage, said wayblock including a plurality of projections extending downwardly into said first basin, said wayblock projections having lower end portions which are spaced from the bottom of said first basin and a plurality of downwardly extending as cast surface areas which are disposed in said first basin with some of said wayblock surface areas extending transversely to other of said wayblock surface areas, said as cast surface areas on said wayblock projections facing toward and spaced from said as cast surface areas on said base projections, first force transmitting means for transmitting operating forces having components extending along and transversely to said track from as cast surfaces on said wayblock to as cast surface areas on said base during operation of said machine tool, said first force transmitting means including a body of cast in situ material which substantially fills said first basin and extends into spaces between said as cast surface areas on said base and wayblock projections, a tool support carriage movable along said track and having means for holding tools to cut material from a portion of the workpiece disposed over said tank, said wayblock including surface means for defining a second upwardly opening basin adjacent to said track, said second basin having a bottom and a rim extending around the periphery of the bottom of said second basin, said wayblock having a plurality of upwardly extending as cast surface areas disposed within said second basin at locations spaced from the rim of said second basin with some of said as cast surface areas within said second basin extending transversely to other of said as cast surface areas within said second basin, said machine tool further comprising a cast spindle housing for supporting a spindle assembly, said spindle housing having projections extending downwardly into said second basin, said spindle housing projections having lower end portions which are spaced from the bottom of said second basin and a plurality of downwardly extending as cast surface areas which are disposed in said second basin with some of said as cast surface areas on said spindle housing projections extending transversely to other of said as cast surface areas on said spindle housing projections, said as cast surface areas on said spindle housing projections facing toward and spaced from said as cast surface areas disposed in said second basin on said wayblock, second force transmitting means for transmitting operating forces from as cast surface areas on said spindle housing to as cast surface areas on said wayblock during operation of said machine tool, said second force transmitting means including a second body of cast in situ material which substantially fills said second basin and extends into spaces between the as cast surface areas on the projections extending downwardly from said spindle housing and the as cast surface areas disposed in said second basin on said wayblock, said machine tool further comprising a spindle assembly at least partially enclosed by said spindle housing for rotating a workpiece, and chip conveyor means for conducting material cut from the workpiece from said tank, said chip conveyor means extending through an opening in a side of said tank to a location adjacent to said wayblock mounting section of said base.

4,539,877

SAWMILL

Robert L. Stevenson, P.O. Box 370, Rogue River, Oreg. 97537

Filed Jan. 31, 1983, Ser. No. 462,331
Int. Cl.³ B27B *7/00*
U.S. Cl. 83—731 **5 Claims**



1. A sawmill comprising
an elongated frame having ground supporting legs,
a pair of rails on the upper portion of said frame,
a wheeled carriage supported on said rails for carrying a log,
a powered input shaft having journaled support in said frame,
a saw blade shaft journaled in said frame,
drive means connecting said input shaft and said saw blade shaft,
a winch drum mounted on a winch drum shaft supported by said frame between the ends of the latter,
a drive cable wound on said drum,
means connecting the ends of said cable to said carriage,
end sheaves on said frame over which said cable is reeved whereby said carriage is arranged to be driven in forward and rearward movements for feeding a log into said saw,

power transfer means operatively connected between said saw blade shaft and said winch drum shaft,

said power transfer means including a pair of V-belt pulley drives connected between said saw blade shaft and said winch drum shaft with one of said drives providing forward movement of said carriage and the other of said drives providing rearward movement of said carriage,

said power transfer means includes an adjustable speed drive means which can be pre-set for controlling the speed drive from said saw blade shaft to the forward V-belt pulley drive for said carriage,

a manually operable carriage control lever having a neutral position and opposite engaged positions for forward and rearward driving movements of said carriage,

said V-belt pulley drives having slippage in said neutral position of said manually operated lever,

and clutch means on each of said V-belt pulley drives operative to engage one of said drive while disengaging the other and vice versa,

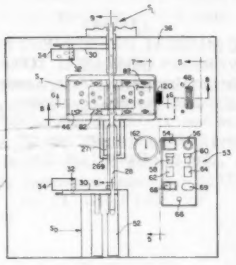
said carriage control lever being manually shiftable to any position which is between said neutral position and its forward engaged position for applying selected clutch engagement of its associated V-belt pulley drive to control the forward speed and driving power of said carriage.

4,539,878

METHOD AND APPARATUS FOR TRIMMING THE LEADS OF ELECTRONIC COMPONENTS

Frank V. Linker, and Frank V. Linker, Jr., both of Broomall, Pa., assignors to American Tech. Manufacturing, Inc., Glenolden, Pa.

Filed Oct. 31, 1983, Ser. No. 547,732
Int. Cl.[3] B23D *33/02, 15/04*
U.S. Cl. 83—99 **31 Claims**



1. Apparatus for trimming leads of electronic devices having a body portion and a plurality of leads extending in rows from opposite sides of said body portion, comprising: a device support; trimming means positioned proximate said device support for trimming lead ends, said trimming means including shear means disposed on opposite sides of said support, cutting blades movably positioned beneath said shear means and when a device is on said support having an initial position between said rows of leads, and means for moving said cutting blades outwardly to cuttingly engage said leads between said blades and said shear means to trim lead ends in an outward cutting motion.

4,539,879

METHOD AND APPARATUS FOR FORMING AND PROCESSING FOOD SPEARS

Walter W. Egee, Wallingford, Pa., assignor to Campbell Soup Company, Camden, N.J.

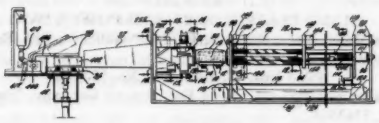
Filed Jul. 13, 1982, Ser. No. 397,881
Int. Cl.[3] B65B *35/40, 35/56*
U.S. Cl. 83—107 **15 Claims**

1. Apparatus for the forming of food spears from an integral food product, and for delivering the spears onto a support means in predetermined orientations about their longitudinal axes, comprising:

knife means for cutting said food product into spears in response to pushing of said product through said knife means:

flat support means for receiving and supporting said spears;

channel means having a different channel extending therethrough for each of said spears formed by said knife means, each of said channels having an inlet end positioned to receive a corresponding different one of said



spears from said knife means and an outlet end positioned to deliver said one spear onto said flat support means;

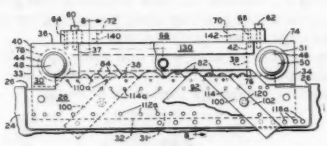
at least some of said channels being twisted about their respective axes between said inlet and outlet ends thereof so as to change the orientation of the spears about their longitudinal axes as they pass through the twisted channels so that they are delivered onto said flat support means all in the same predetermined orientation about their axes and each parallel to the other and to the flat support means.

4,539,880

SELF-CONTAINED CORNER RADIUS PUNCH AND DIE MACHINE

Eugene F. Barber, 18810 Kingswood Ter., Minnetonka, Minn. 55343, and Steven C. Barber, 18900 Highland Ave., Deephaven, Minn. 55391

Filed Feb. 23, 1984, Ser. No. 582,837
Int. Cl.[3] B26D *7/01, 3/10*
U.S. Cl. 83—467 R **15 Claims**



1. A self-contained, independently operable corner radius punch and die machine comprising,

a supporting framework including a die support having a die shoe at the upper end thereof,

a motive power actuator means mounted at the top of the framework below the die support and having an actuator rod extending upwardly past the die shoe,

a die mounted on the die shoe,

a punch support shoe having a punch mounted thereon above the die and adapted to reciprocate thereabove in cooperative aligned relationship therewith to shear off the portions of a workpiece extending therebetween,

the upper end of the actuator rod being connected to the punch shoe,

dual guide means for maintaining relative alignment between the punch and the die comprising,

a first pair of laterally spaced apart parallel vertically disposed guide post and bushing assemblies operatively connected between the punch and die at each side thereof,

a second fixed guide assembly attached to the die base including at least one vertically disposed guiding groove and a gib with parallel side edges connected rigidly to the punch and mounted within the groove with adjacent side surfaces of the gib and the groove in sliding engagement,

the operation of the motive power actuator means acting to draw the actuator rod in a downward direction and being adapted to force the punch past the cooperating edge of the die to sever corner portions from the workpiece and the first guide means preventing motion of the punch in a horizontal plane in any direction and the second guide means restricting the motion thereof to prevent the punch from being tilted about a horizontal front-to-rear axis thereof during operation.

4,539,881

GUIDE PLATE FOR A HAND POWER SAW

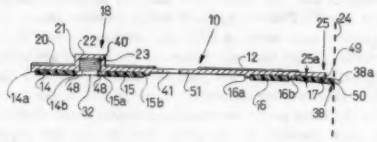
Peter Maier, Gerokstrasse 1, D-7311 Neidlingen, Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 553,054

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243564

Int. Cl.³ B27B *9/04*

U.S. Cl. 83—745 **11 Claims**



1. A hand power saw guide plate comprising:

a plate member having a low friction top surface adapted to slidably receive a hand power saw, a bottom surface adapted to face a workpiece to be cut along a cutting line, and a first edge adapted to be adjacent the cutting line;

anti-slip means connected to said plate member and covering at least a portion of said bottom surface for establishing a frictional support work-face in a work-face plane for engagement with a workpiece;

a guide lip made of non-splitting elastic material connected to said bottom surface of said plate member and extending over and beyond said first edge and over a position of the cutting line whereby an outer portion of said guide lip can be cut from said guide lip along the cutting line to leave an outer edge on said guide lip; and

biasing means associated with said guide lip for biasing said guide lip downwardly beyond said work-face plane for elastically engaging a workpiece to be cut.

4,539,882

AUTOMATIC ACCOMPANIMENT GENERATING APPARATUS

Keiji Yuzawa, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1982, Ser. No. 451,816

Claims priority, application Japan, Dec. 28, 1981, 56-210989; Jul. 15, 1982, 57-122158

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **33 Claims**

1. An automatic accompaniment generating apparatus, comprising:

memory means for storing tone data;

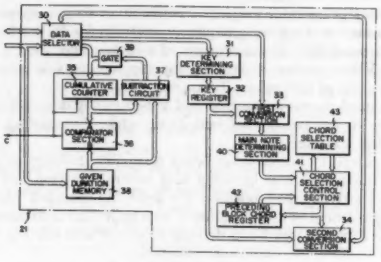
input means for inputting a series of tone data including pitch code and duration code of tones forming a melody of a music number into said memory means; and

logic circuit means coupled to said memory means for generating a series of accompaniment data for forming an accompaniment of the music number, wherein each of said accompaniment data is determined according to the series of tone data forming the melody stored in said memory means;

wherein the logic circuit means includes key determining means for determining a key of the music number according to the series of tone data forming the melody, and wherein said key determining means includes:

means for obtaining a shift amount according to the pitch code of the last tone of the melody stored in said memory means,

means for converting each pitch code of the tone data read out from said memory means into a shifted pitch code in accordance with the shift amount obtained by said obtaining means, and for accumulating the duration code for each said shifted pitch code to obtain a total duration code for each said shifted pitch code,



means for comparing predetermined ones of the total duration codes and for obtaining a shifted key of the music number which is converted by said shift amount, and

means for determining the key of the music number by reversely shifting the shifted key of the music number according to a reversely shift amount which is determined by said shift amount.

4,539,883

ELECTRONIC MUSICAL INSTRUMENT PERFORMING D/A CONVERSION OF PLURAL TONE SIGNALS

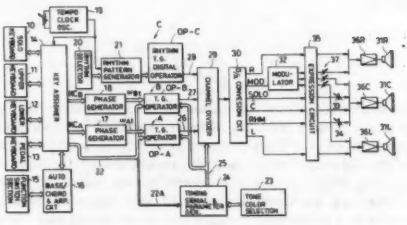
Masanobu Chihana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 21, 1983, Ser. No. 553,745

Claims priority, application Japan, Nov. 25, 1982, 57-205503

Int. Cl.³ G10H *1/08, 7/00*

U.S. Cl. 84—1.22 **9 Claims**



9. An electronic musical instrument comprising:

tone generator means for generating a plurality of different digital musical tone signals in respective time division multiplex channels,

a digital-to-analog converter utilized commonly on a time division multiplex basis for all of said channels, said digital-to-analog converter receiving and converting to analog form the time division multiplexed plural digital musical tone signals generated by said tone generator means, and

a plurality of sample and hold circuits, each associated with a respective one of said time division multiplex channels, each respectively sampling and holding the analog output of said digital-to-analog converter in time correspondance with the associated channel, said sample and hold circuits

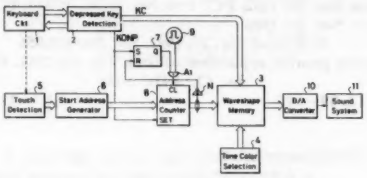
delivering the analog signals held thereby as respective sustained analog musical tone signals.

4,539,884

ELECTRONIC MUSICAL INSTRUMENT OF WAVESHAPE MEMORY TYPE WITH EXPRESSION CONTROL

Eiichiro Aoki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 7, 1983, Ser. No. 529,977
Claims priority, application Japan, Sep. 16, 1982, 57-159637
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.24 **10 Claims**



10. An electronic musical instrument of waveshape memory type comprising:

a waveshape memory storing single waveshape data which covers from start to end of a musical tone and which varies gradually in shape, amplitude and/or cyclic period as the waveshape extends through succeeding cycles;

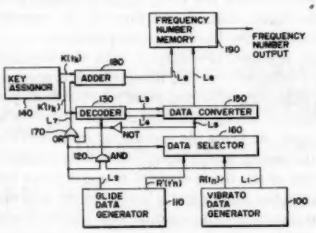
expression control means for controlling a start address from which said single waveshape data begins to be read out, so that the tone characteristics of a produced tone are varied according to the expression control means.

4,539,885

ELECTRONIC MUSICAL INSTRUMENT

Sadaaki Ezawa, Iwata, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Continuation of Ser. No. 372,052, Apr. 26, 1982, abandoned.
This application Apr. 24, 1984, Ser. No. 603,116
Claims priority, application Japan, Apr. 30, 1981, 56-65711
Int. Cl.³ G10H *1/04, 7/00*
U.S. Cl. 84—1.25 **2 Claims**



1. An electronic musical instrument having a plurality of keyboards each with keys for playing notes having note names, comprising:

a frequency number memory (**190**) for storing a frequency number for each note name of each key and a frequency number for modulation for each note name for providing at least one of a vibrato and a glide effect;

frequency modulated data generating means (**100, 110**) for selectively generating one of glide and vibrato data;

a key assignor (**140**) for generating key depression information and keyboard information;

the frequency number memory storing therein the frequency number for each note at an address using the key depression information as a function and the frequency number for modulation for each note name at an address using, as functions, frequency modulated data from the frequency modulated data generating means (**100, 110**) and the key depression information, the frequency number memory additionally storing therein the frequency number corresponding to each note name at an address using the key depression information and the keyboard information as functions;

an address signal for the frequency number memory being divided into a high-order address (**L8**) by high-order bits and a low-order address (**L6**) by low-order bits;

means (**180, 130**) for addressing the high-order address by the key depression information and the low-order address by the frequency modulated data; and

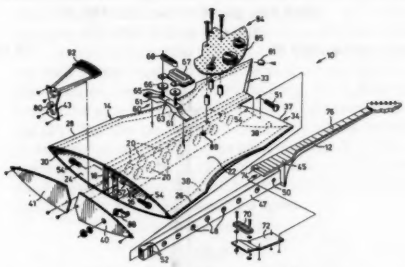
a data converter (**15**) connected in a signal path of the low-order address (**16**) for converting the output of the frequency modulated data generating means (**100, 110**) in relation to the keyboard information, the converted output being used as the low-order address of the frequency number memory (**190**).

4,539,886

GUITAR

Dean Hoffart, #429-93 Parliament St., Toronto, Ontario, Canada M5A 3Y7

Filed Jun. 29, 1984, Ser. No. 626,246
Int. Cl.³ G10D *1/08*
U.S. Cl. 84—267 **9 Claims**



1. A guitar having a body portion and a neck extending from said body portion,

the body portion comprising central core means and a top and bottom panel of resilient sheet material sandwiching the core means between them, the panels being substantially flat when unstressed, but being bowed around the central core means so that the side edges of the panels are juxtaposed, whereby the top panel is stressed so that it is rounded convex upwardly and the bottom panel is stressed so that it is rounded convex downwardly, the two panels defining a volume of lenticular cross-section having two ends,

a lower bridge foot secured against the top panel and supporting a lower bridge,

and strings stretched between the lower bridge and a position on the neck.

4,539,887

STRING INSTRUMENT OF GUITAR TYPE

Johan B. Bjerkas, Skogslyckevägen 14, S-440 92 Svanesund, Sweden

PCT No. PCT/SE83/00175, § 371 Date Jan. 12, 1984, § 102(e) Date Jan. 12, 1984, PCT Pub. No. WO83/04125, PCT Pub. Date Nov. 24, 1983

PCT Filed May 3, 1983, Ser. No. 574,151

Claims priority, application Sweden, May 17, 1982, 8203063

Int. Cl.[3] G10D *3/06*

U.S. Cl. 84—314 R 10 Claims

1. A string instrument of guitar type, characterised in that each fret on the fingerboard represents a whole tone and in that adjacent strings are tuned in such a manner that the open string notes of these strings are distinguished from one another by alternately four and three semitones, that is, they are tuned alternately to major and minor thirds.

4,539,888

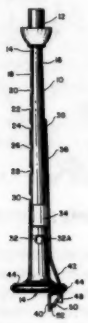
EXTENDED RANGE MUSICAL PIPE INSTRUMENT

Maurice Whelan, 60 Main St., Hastings-on-Hudson, N.Y. 10706

Filed Feb. 24, 1984, Ser. No. 583,377

Int. Cl.[3] G10D *7/06*

U.S. Cl. 84—380 B 16 Claims



1. A hand held musical pipe instrument comprising a pipe body which is adapted to be supplied with air at a first end and has the other end normally open with a plurality of intermediate longitudinally spaced openings in the wall thereof and wherein at least some of said wall openings are positioned and arranged to be selectively closed by finger action of the player, said instrument including a longitudinally slidable sleeve member positioned and arranged on the exterior of said pipe body for selective longitudinal positioning by one of the fingers of the player to at least partially cover or uncover one of said wall openings to thereby provide for a tone pitch change.

4,539,889

AUTOMATIC PISTOL WITH COUNTERACTING SPRING CONTROL MECHANISM

Gaston Glock, Siebenbürger Strasse 16-12, A-1220 Vienna, Austria

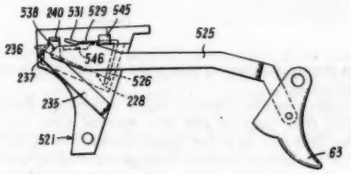
PCT No. PCT/AT82/00015, § 371 Date Dec. 30, 1982, § 102(e) Date Dec. 30, 1982, PCT Pub. No. WO82/03910, PCT Pub. Date Nov. 11, 1982

PCT Filed Apr. 29, 1982, Ser. No. 456,056

Claims priority, application Austria, Apr. 30, 1981, 1944/81

Int. Cl.[3] F41C *5/00*

U.S. Cl. 89—147 11 Claims



1. A pistol comprising:

a frame;

a barrel slidable on the frame and having a cartridge-receiving rear end;

a breech slidable on the frame and engageable over the rear end of the barrel to form a cartridge chamber;

firing means including a firing element and a firing pin operatively linked thereto, the element being movable on the breech toward and away from the barrel between a rear position in which the firing pin is out of the cartridge chamber and a front position with the firing pin projecting forward into the cartridge chamber for firing a cartridge in the chamber when the firing element moves from the rear to the front position and through an intermediate position between the front and rear positions;

spring means operatively engaged with the element and including a relatively strong firing spring braced against the firing element and urging same into the front position with a relatively strong force and a relatively weak spring braced against the firing pin and urging same into the rear position, the strong spring being sufficiently loaded in the rear position of the firing element to move same into the front position but insufficiently loaded in the intermediate position to move the firing element into the front position;

a trigger movable on the frame between an actuated and an unactuated position;

an abutment engageable with the firing element in the intermediate position and displaceable backward on the frame; and

link means connected between the trigger and the abutment for displacing same backward into the rear position from the intermediate position on displacement of the trigger from the unactuated to the actuated position and for displacing the abutment out of operative engagement with the firing element on displacement of the trigger into the actuated position for displacement of the firing element by the spring means into the front position and subsequent return at least to the intermediate position.

4,539,890
CARTRIDGE INFEED APPARATUS FOR AUTOMATIC FIRING WEAPONS

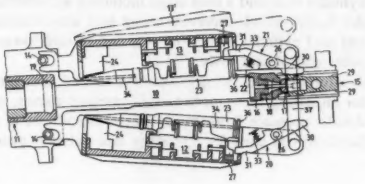
Werner Bosshard, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Aug. 17, 1983, Ser. No. 524,071

Claims priority, application Switzerland, Sep. 3, 1982, 5238/82

Int. Cl.[3] **F41D** *9/00, 11/14*

U.S. Cl. 89—33.2 **5 Claims**



1. A cartridge infeed apparatus for an automatic firing weapon having a weapon barrel, comprising:

a breechblock displaceable between a rearmost position and a forwardmost position;

at least one cartridge infeed channel having a side wall;

said side wall possessing a slot which extends substantially parallel to a lengthwise axis of the firing weapon and into which slot there partially extends a cartridge located in said cartridge infeed channel;

cartridge infeed means for feeding a cartridge into said slot and holding the same therein so as to partially protrude into said slot when placed in a position for being pushed into said weapon barrel by means of said breechblock;

said cartridge infeed means comprising a two-armed insertion lever;

a control cam provided for said breechblock;

said cartridge being supported at one arm of said two-armed insertion lever and the other arm of said two-armed insertion lever being supported at said control cam;

means for pivotably mounting said two-armed insertion lever relative to said firing weapon; and

said control cam being structured such that said two-armed insertion lever presses said cartridge into said slot with said one arm thereof when said breechblock is in said rearmost position.

4,539,891
SERVO BOOSTER MECHANISM

Peter V. Colan; Kenneth L. Miller, and Henry P. Tyler, all of South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 19, 1984, Ser. No. 591,151

Int. Cl.[3] **F15B** *15/17*

U.S. Cl. 91—49 **11 Claims**

1. In a system having a servo booster mechanism through which an input signal is modified to produce a corresponding output signal for moving a linkage to supply a device with an operational input, said servo booster mechanism being characterized by

a housing having a cavity therein;

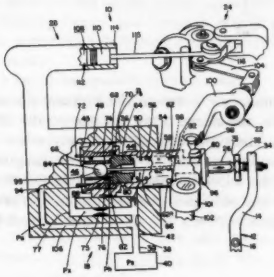
piston means located in said cavity for establishing first and second chambers therein, said piston means having a projection that extends through said housing, said projection having a first bore therein connected to a surrounding environment, said projection being connected to said linkage;

a cylindrical member located in said first bore, said cylindrical member having a second bore therein for connecting said second chamber with the first bore, said cylindrical member having an annular seat that surrounds a central opening and a control orifice through which fluid from said second chamber flows into said second bore;

conduit means connected to a source of fluid under pressure (P_s) having a first branch connected to said first chamber and a second branch connected to said second chamber;

first restrictor means located in said second branch to create a pressure drop in said fluid presented to said second chamber to create a fluid pressure (P_x);

valve means located in said second bore, said valve means cooperating with said cylindrical member to define a third chamber within said second bore, said control orifice being connected to said third chamber and said third chamber being connected to said first bore through said central opening, said valve means having a plunger with a second face exposed to a fluid pressure P_h) in said third chamber and a first face exposed to the fluid pressure (P_x) in said second chamber, the relationship of said first face and annular seat controlling the flow of fluid from said



third chamber into said first bore for communication to said surrounding environment, said input signal moving said plunger to change the relationship between said first face and annular seat to allow fluid to flow from said third chamber and change the fluid pressure therein from P_h to P_h-1, said change in the fluid pressure P_h in said third chamber producing a corresponding change in the fluid pressure P_x in said second chamber to P_x-1 to create a pressure differential (P_s-P_x-1) across said piston means, said pressure differential (P_s-P_x-1) acting on and moving said piston means to produce said output signal, said piston means on moving reestablishing the P_x fluid pressure in the second chamber whereby the pressure differential (P_s-P_x) acts on and holds the piston means stationary to reestablish the relationship between said first face and annular seat whereby a substantially constant volume of fluid flows from said third chamber to the surrounding environment by way of said first bore.

4,539,892
HYDRAULIC BRAKE BOOSTER

John E. Mackiewicz, Niles, Mich., and Jack Martinic, South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

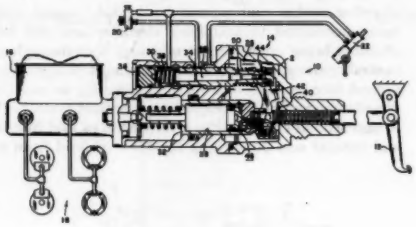
Filed Mar. 12, 1984, Ser. No. 588,430

Int. Cl.[3] **F15B** *13/10;* **F01B** *25/02*

U.S. Cl. 91—391 R **2 Claims**

1. A hydraulic brake booster comprising a housing defining a pressure chamber with a pair of bores leading to the pressure chamber, an output piston movably disposed within one of the pair of bores, a valve member movably disposed within the other bore and defining a fluid passage communicating fluid pressure to the pressure chamber in response to movement of the valve member between first and second operative positions, the valve member movably carrying a sleeve at one end thereof, said sleeve being disposed in the pressure chamber and cooperating with an actuator which controls movement of the valve member, a resilient member biasing the sleeve to a rest

position on the valve member, and a poppet member engageable with the sleeve and cooperating with the valve member to open the fluid passage to the pressure chamber during a first mode of operation, characterized by the sleeve being movable on the valve member in a second mode of operation during braking when the fluid pressure in the pressure chamber is insufficient to move the output piston in order to permit the poppet member to fully seat against the valve member and



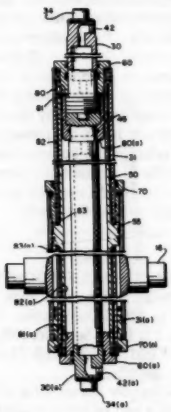
close communication between the pressure chamber and the fluid pressure, the sleeve being slidable on the valve member with a non-fluid-tight clearance therebetween, the poppet member including an annular skirt telescoping over the said one end of the valve member to oppose the sleeve and the annular skirt and provided with at least one slot providing fluid communication between the fluid passage and the pressure chamber.

4,539,893

POWER FEED SYSTEM FOR A ROTARY DRILL

Hans Zingl, Allentown, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 23, 1984, Ser. No. 613,363
Int. Cl.[3] F01B *15/02*
U.S. Cl. 92—52 **4 Claims**



1. A power feed system for translating a carriage along the length of a tower assembly comprising:

carriage means attached to a tower means for longitudinal translation relative thereto;

a compound hydraulic cylinder means having rod ends fixed to both the top and bottom portion of said tower means, and a first and second hollow cylinder rod;

said first hollow cylinder rod being attached to said tower at the top and said second hollow cylinder rod being attached to said tower at the bottom;

said first cylinder rod and said second cylinder rod being joined to a common piston;

said first cylinder rod and said second cylinder rod further being supplied with hydraulic pressure fluid at each end attached to the tower;

said hydraulic cylinder means being further provided with an intermediate stage receiving hydraulic fluid from said cylinder rods and a final stage including an external cylinder barrel which traverses along said intermediate stage and said cylinder rods from one end of said tower to the other end of said tower;

said external barrel being connected to said carriage means for imparting movement to said carriage means; and

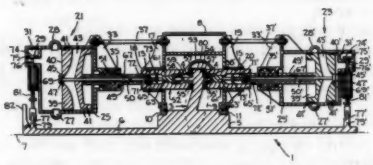
hydraulic pressure fluid supply means introduced at each of the fixed rod ends for operating said cylinder means.

4,539,894

SINGLE ACTING STEAM ENGINE

Marion K. Harris, 4755 Dolores Ave., Atascadero, Calif. 93422

Continuation-in-part of Ser. No. 349,204, Feb. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 208,243, Nov. 11, 1980, abandoned, which is a division of Ser. No. 44,865, Jun. 4, 1979, Pat. No. 4,262,579. This application Apr. 13, 1984, Ser. No. 599,790
Int. Cl.[3] F01B *9/00*
U.S. Cl. 92—138 **5 Claims**



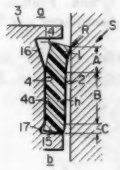
1. In an engine of the type that has a swash plate rotatable about an axis that is generally transverse to the plate and at least one actuating member mounted for movement in a direction that is generally parallel to the axis, said swash plate having a throat, the improvement which comprises: means defining an annular thrust surface on the throat of said swash plate extending around said axis, any radial portion of said surface being disposed at right angles to the axis; a thrust member disposed between the swash plate and the actuating member and having a force-transmitting surface any portion of which is radial to the axis, is disposed normal to the axis, and is in contact with said thrust surface; and means defining engaging rocking surfaces on said actuating member and on said thrust member to permit rocking movement of said thrust member relative to said actuating member to accommodate variations in the circumferential angularity of the thrust surface of the swash plate as it rotates, the rocking surface on said thrust member being segmented cylindrical in configuration and formed on a radius around an axis disposed within the throat of the swash plate, said thrust of said swash plate having a thrust surface oppositely directed from said thrust surface, said axis of said radius for the configuration of said segmental cylindrical surface of said thrust member being located midway between said thrust surfaces, the thickness of said throat between said thrust surfaces being of uniform dimension about the circumference thereof.

4,539,895

SEALING DEVICE

Hiroshi Tanaka, Niiza; Mutuo Sugisaki, Kamifukuoka, and Kazuhiro Itoh, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 425,955
Claims priority, application Japan, Jan. 29, 1982, 57-12860
Int. Cl.³ F16J *9/28*
U.S. Cl. 92—249 **2 Claims**



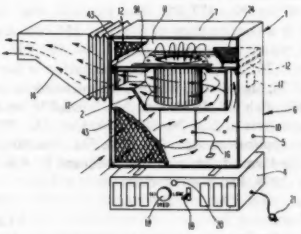
1. A sealing device for ensuring fluid tightness between a piston having an annular piston ring groove on its outer surface and a cylinder into which said piston is slidably fitted, wherein the sealing device essentially comprises an annular endless resilient seal ring made of a resilient sheet-like material and having in its unmounted condition an inner diameter smaller than the outer diameter of said annular piston ring groove, one of the opposite surfaces of said resilient seal ring being fitted is said piston ring groove in a facing manner with respect to the bottom surface of the groove, the inner peripheral part of the resilient seal ring constituting an embracing portion adapted to embrace the piston ring groove while the outer peripheral part of the same is projected outward beyond the outer surface of said piston in its mounted position and constitutes a seal lip in resilient contact with the inner wall of the cylinder bore, and said piston ring groove is formed with an annular relief groove at one end thereof opposite to the rear face of said outer peripheral part of said seal ring, said relief groove having a depth larger than that of said piston ring groove, for allowing free deformation of said seal lip in the radial direction, said piston ring groove being further formed with an annular engagement groove at the other end thereof having a depth thereof larger than that of said ring groove and receiving an innermost peripheral edge of the inner peripheral part of said resilient seal ring.

4,539,896

AIR HEATING AND FILTERING APPARATUS

Alfonso Thomas, 894 N. James St., Hazleton, Pa. 18201

Filed Oct. 13, 1983, Ser. No. 541,779
Int. Cl.³ F24F *9/00*; **F24H** *3/00*
U.S. Cl. 98—1 **1 Claim**



1. A heat zoning apparatus for residential buildings with more than one story which comprises

a. a generally cube-shaped main body comprising an intake section, a blower section and an outlet section;

b. a variable speed blower mounted in said main body which communicates with the intake section and the outlet section;

c. a first means for filtering mounted across the intake section and comprising one side of said main body;

d. a second means for filtering mounted upstream of said blower inlet;

e. a cylindrical outlet duct communicatingly mounted to said main body;

f. a series of outlet ports of at least two different diameters defined in said outlet duct, each part of circular configuration and placed in a spaced relationship to each other along the length of the duct;

g. a rotational mount attached to said main body comprising a circular collar of a diameter accommodatingly larger than the duct diameter to allow rotation of the duct within the collar and wherein said collar is calibrated to allow recordation of the duct portion with relation to the main body;

h. a smoke detector and smoke alarm mounted downstream of said filtering means and upsteam of said blower and means for activating said blower upon detection of a given level of smoke;

i. means for supplying power to the blower;

j. means for adjusting blower speed;

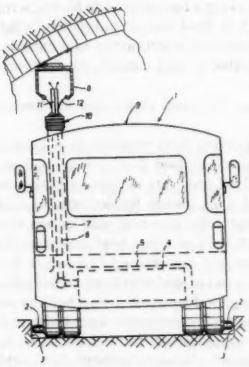
k. means for mounting the entire apparatus on a wall at ceiling height whereby air from the area to be treated is pulled through said first filter means and subsequently through said second filter means into intake section by the blower operation and forced through the outlet section to said outlet duct and along said outlet duct discharging through outlet ports so as to filter and re-circulate the air in the treated area while forming an air barrier along the length of said outlet duct.

4,539,897

DUCT SYSTEM FOR A TRACK-GUIDED VEHICLE

Horst Fleischer, Weinstadt, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,475
Int. Cl.³ F23J *11/00*
U.S. Cl. 98—49 **1 Claim**



1. An exhaust duct system for a track-guided vehicle powered by an internal combustion engine, said duct system extending vertically above a roof of said vehicle into a force-vented exhaust channel located adjacent to a driving route of said vehicle, said duct system comprising:

an exhaust conduit;

a protective pipe surrounding said exhaust conduit and terminating a short distance above said roof;

a transfer pipe extending into said channel, said pipe having

a boat-shaped horizontal cross-section; said transfer pipe being biased toward a vertical position; and

connecting means for connecting said exhaust conduit and said protective pipe to said transfer pipe, said connecting means forming a substantially gas-tight connection and said connecting means being pivotable about an axis extending substantially parallel to a longitudinal axis of said vehicle, wherein

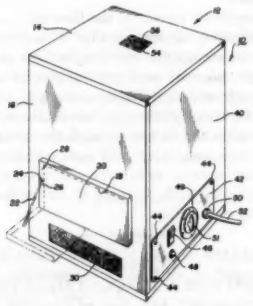
said connecting means comprises elastic pleated metal bellows, said bellows acting to bias said transfer pipe toward a vertical position.

4,539,898

SEMIAUTOMATIC FOOD FRYING APPARATUS

Charles D. Bishop, Dallas; Kenneth H. Stamps, Garland, and David L. Turney, Dallas, all of Tex., assignors to Alpaire, Inc., Garland, Tex.

Filed Aug. 8, 1983, Ser. No. 520,326
Int. Cl.³ A47J *37/12*
U.S. Cl. 99—336 **36 Claims**



1. Semiautomatic food frying apparatus adapted for use in an enclosed space without connection to an outside exhaust system, said apparatus comprising:

a cabinet adapted to be supported at a suitable working height and having a top panel, side panels, a rear panel and a front panel, at least one of said panels being configured to allow access to the interior of said cabinet;

a container located in said cabinet, for holding a supply of cooking oil;

means, integral with said container, for heating said container;

means for supporting food products in the cooking oil during the cooking of said food products, said means for supporting food products includes a handle means; and

means to hold said means for supporting food products while automatically lowering said means for supporting food products into said supply of cooking oil for a predetermined time and then raising said means for supporting food products out of said supply of cooking oil, said means for supporting food products being held by said means to hold by using and resisting the forces of gravity and rotation applied to said means to hold through said means for supporting food products without the requirement for releasable latching means, said means to hold comprising:

(a) means to engage said handle means in a slidably-fitting relationship while supporting same, said means to engage comprises at least one U-shaped channel device configured to be capable of supporting said handle means along three separate surfaces, said means to engage further comprising stop means attached to a predetermined end of said U-shaped channel device to engage a fourth surface of said handle means,

(b) rotatable means attached to said means to engage and capable of rotating in both directions within defined limits,

(c) means to provide a rotatable force to said rotatable means, and

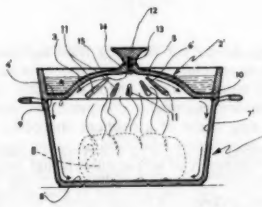
(d) means to control the means to provide such that the rotatable force is controlled in amount of time of application as well as direction.

4,539,899

VESSEL FOR COOKING FOOD WITH COOLING LID

Paul Schmitt, Fresnoy Le Grand, France, assignor to Haut Fourneau et Fonderies de Cousances aux Forgers, S.A., Ancerville, France

Filed Sep. 23, 1981, Ser. No. 304,981
Claims priority, application France, Sep. 24, 1980, 80 20458
Int. Cl.³ A47J *37/10*
U.S. Cl. 99—347 **6 Claims**



1. A vessel for cooking food, of the type comprising a hollow body having sidewalls extending upwardly from a bottom wall, said sidewalls having an internal surface and a removable lid with internal and external surfaces which may be placed on the sidewalls of said hollow body, said removable lid having a convex and elevated central portion and having on its external surface a cavity for receiving water between a rim about the periphery thereof which cavity is annular and disposed around said convex and elevated central portion of said lid, the top of which is substantially level with the peripheral rim of the cavity so that the depth of the water increases from the center of the lid to the periphery thereof, and wherein at least the central portion of the internal surface of the lid is substantially dome-shaped and the periphery of the internal surface of said lid terminates at and merges with the sidewalls of said hollow body at a point where the internal surface of said sidewalls terminate and which is substantially at the top of said sidewalls.

4,539,900

APPARATUS FOR HEATING FOOD PRODUCTS

Claude A. Reed, Omaha, Nebr., assignor to International Food Equipment, Inc., Peoria, Ill.

Continuation of Ser. No. 457,530, Jan. 13, 1983, Pat. No. 4,446,775, which is a continuation of Ser. No. 251,906, Apr. 7, 1981, abandoned, which is a division of Ser. No. 909,795, May 26, 1978, Pat. No. 4,261,258, which is a continuation of Ser. No. 719,585, Sep. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 446,951, Feb. 28, 1974, Pat. No. 3,996,874, which is a continuation-in-part of Ser. No. 190,254, Oct. 18, 1971, abandoned. This application Apr. 27, 1984, Ser. No. 604,925
The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.
Int. Cl.³ A47J *37/12*
U.S. Cl. 99—353 **3 Claims**

1. An appliance for imapling a food product onto heating grills, and which is adapted to impale hamburger patties onto such grills, preparatory to a cooking operation, the combination comprising:

a plurality of heat conductive grill means each of which has an end for insertion into the food product;

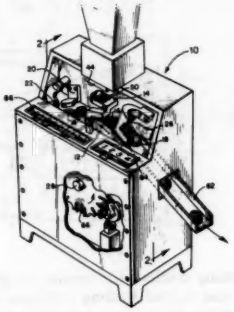
said plurality of grill means mounted in an array and adapted to be inserted as a group into the food product;

a container for a liquid cooking medium;

means for heating the liquid cooking medium;

means for moving said grill means and the food product relatively toward each other for impaling the food product onto said grill means;

said means for moving said grill means and the food product relatively toward each other including cam means, lever



means cooperating with said cam means, and means for rotating said cam means such that said lever means applys sufficient force between said grill means and the food product so as to impale the food product on said grill means; and

means for maintaining said grill means at least partially submersed in said liquid cooking medium for at least a portion of the time said food product is impaled on said grill means.

4,539,901

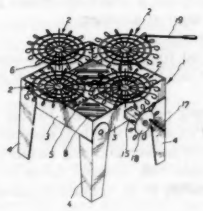
PORTABLE BARBECUE GRILL

Ming-Tang Chen, No. 14, Alley 89, Lane 59, Nan-Man Rd., Taichung, Taiwan

Filed Aug. 26, 1983, Ser. No. 526,885

Int. Cl.[3] **A47J** *37/04*

U.S. Cl. 99—393 **11 Claims**



1. A portable barbecue grill which comprises

an upwardly open container defined by a floor element and at least one upwardly extending side wall, said container being capable of containing charcoal therein,

a plurality of leg elements pivotally attached to said container, said leg elements being movable from a first stored position wherein they extend in parallel to said floor element of said container to a second position where they extend perpendicularly to said floor element of said container,

a mounting element positioned on the floor element of said container for supporting separate grill elements thereabove, said mounting element comprising first and second arms which are connected at their centers and extend perpendicularly to one another, a generally tubular socket respectively mounted to the opposite ends of each of said first and second arms to extend upwardly with respect to said container, and a removable pipe respectively mounted in each of said upwardly-extending sockets, each said pipe extending upwardly to a point above the adjacent side wall of said container, and

four rack elements for supporting food above the charcoal in said container, each rack element including a generally flat food-supporting grate and a support element connected to said grate to extend perpendicularly with respect thereto, the support element of each rack element being removably mounted in and rotatable with respect to a respective pipe of said mounting element, and the generally flat grate of each rack element being sufficiently large to include a portion which extends beyond the adjacent side wall of said container and including teeth extending outwardly therefrom, the teeth of adjacent flat grates being interengageable such that the rotation of one rack element will cause simultaneous rotation of each adjacent rack element.

4,539,902

CHEESE BLOCK FORMER

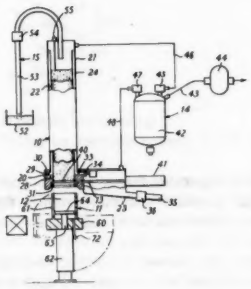
Ian P. Brockwell, Wyckoff, N.J., and Herbert W. Hancock, Merriott, England, assignors to Alfa-Laval Cheese Systems Limited, Somerset, England

Filed Aug. 22, 1983, Ser. No. 525,241

Claims priority, application United Kingdom, Aug. 24, 1982, 8224230

Int. Cl.[3] **A01J** *25/12;* **A23C** *19/00*

U.S. Cl. 99—454 **6 Claims**



1. Apparatus for forming blocks of cheese from prepared cheese curd, comprising a hollow tower having a bottom formed with an opening therein, a tubular perforated column in the tower above said opening, the tubular column being open at its lower end, a guillotine having a blade movable between a closed position in which the blade closes the lower end of the column and an open position in which the blade is withdrawn from the lower end of the column so as to leave the lower end of the column open, a former unit defining an open topped chamber, means for moving the former unit between a receiving position in which the former unit closes said opening in the bottom of the tower with said chamber aligned with the column for reception of curd therefrom and a discharge position in which the top of said chamber is exposed for discharge of a block of cheese from the chamber, vacuum means for creating a sub-atmospheric pressure in the tower and column, means for introducing prepared cheese curd into the upper end of the column to build-up a pillar of curd therein while the tower and column are at sub-atmospheric pressure, means for removing from the tower whey expressed from the lower end of the pillar of curd through the perforations in the column due to the weight of curd superimposed thereon, and an elevator in the chamber operable to lower the pillar of curd in the column

when the guillotine blade is in the open position so that the lower end portion of the pillar extends into the chamber, the guillotine being operable to cut a block of cheese from the lower end of the pillar of curd upon movement of the guillotine blade into the closed position, and the elevator being operable to eject the block of cheese from the chamber when the former unit is moved into its discharge position.

4,539,903

FILLING APPARATUS

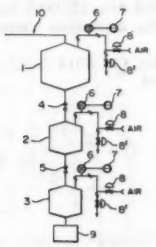
Ko Sugisawa; Kazuya Sekiguchi; Masao Taguchi; Masayuki Nakatani, and Hitoshi Iwata, all of Higashiosaka, Japan, assignors to House Food Industrial Company Limited, Higashiosaka, Japan

Filed Apr. 18, 1984, Ser. No. 601,492

Claims priority, application Japan, Apr. 19, 1983, 58-70803; Oct. 6, 1983, 58-188928

Int. Cl.³ A23L *3/00*

U.S. Cl. 99—470 **4 Claims**



1. A filling apparatus for continuously treating a product under a high pressure and concurrently filling the treated product into containers in a stable and continuous manner, comprising:

pressurizing tank means having an internal pressure maintained at a high level for applying high pressure to apparatus disposed upstream thereof and for recovering the product under high pressure;

buffer tank means disposed downstream of said pressurizing tank means for collecting the product under high pressure from said pressurizing tank means and for passing the product downstream thereof under a pressure lower than the internal pressure of said pressurizing tank means or under an ambient pressure;

filling tank means disposed downstream of said buffer tank means for collecting the product from said buffer tank means and for passing the product downstream thereof;

filler means disposed downstream of said filling tank means for filling the product into said containers;

pressure control means for controlling the internal pressure of each of said pressurizing tank means, said buffer tank means and said filling tank means by a gas pressure;

transfer pipe means for connecting said pressurizing tank means, said buffer tank means, said filling tank means and said filler means to one another and for transferring the product; and

valve means for opening and closing a first passage between said pressurizing tank means and said buffer tank means and for opening and closing a second passage between said buffer tank means and said filling tank means.

4,539,904

HUSKING MACHINE FOR CEREALS

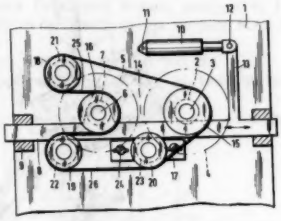
Walter Vick, Hamburg, and Rolf Suhrbier, Norderstedt, both of Fed. Rep. of Germany, assignors to F.H. Schule GmbH, Hamburg, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,682

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 8320494[U]

Int. Cl.³ B02B *3/04*

U.S. Cl. 99—618 **2 Claims**



1. A husking machine for cereals, comprising:

(a) first and second husking rollers both cooperating with each other to produce a husking action, said first and second husking rollers each having a substantially cylindrical wall defining a substantially cylindrical volume;

(b) first and second shaft members concentrically disposed within said substantially cylindrical volume of said first and second husking rollers respectively for supporting said first and second husking rollers respectively;

(c) a machine frame;

(d) a first plurality of fixed bearings for fixably supporting said first shaft to said machine frame;

(e) at least two guide members fastened to said machine frame, at least one of said guide members being in opposing relation with at least one other of said guide members such that said first and second husking rollers are located between said opposing guide members;

(f) a support member slideably engaging said guide members;

(g) a second plurality of fixed bearings for fixably supporting said second shaft to said support member, said second husking roller being slideably adjustable in a path aligned with said first husking roller by means of the slideable action of said support member;

(h) a belt member;

(i) first and second roller pulleys being coaxially disposed and fastened to said first and second shaft members respectively;

(j) a first deflecting pulley fastened to said machine frame and positioned to accept said belt member from said first roller pulley and deliver said belt member to said second roller pulley, said belt member being delivered to said second roller pulley in an orientation parallel to said support member;

(k) a second deflecting pulley fastened to said support member at a point displaced from the fastening point of said second shaft, said second deflecting pulley being positioned to accept said belt member from said second roller pulley, said belt member being guided by said first deflecting pulley, by said second roller pulley, and by said second deflecting pulley through a path substantially similar to a Z shape; and

(l) a third deflecting pulley fastened to said machine frame and positioned to accept said belt member from said second deflecting pulley in an orientation parallel to said support member, and also positioned to deliver said belt member to said first roller pulley, said delivery completing a path of said belt member going from said first roller pulley to said first deflecting pulley, then to said second roller pulley, then to said second deflecting pulley, then to

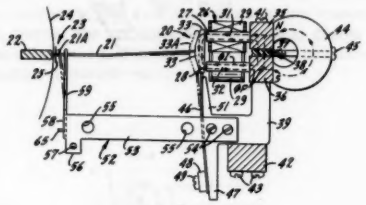
said third deflecting pulley, and finally, back to said first roller pulley.

4,539,905

DOT MATRIX LINE PRINTER AND PRINT ELEMENT DRIVER ASSEMBLY THEREFOR

Walter J. Zenner, 10801 Highway E - R-3, Mukwonago, Wis. 53149

Filed Dec. 5, 1983, Ser. No. 558,347
Int. Cl.³ B41J 3/12
U.S. Cl. 101—93.05 21 Claims



1. An electromagnetic/permanent magnet driver assembly for a recorder, the driver assembly comprising:

N electromagnets, each electromagnet including an armature, magnetic core means affording an individual local magnetic circuit, and an electrical coil mounted on the core means for generating electromagnetic flux in the local magnetic circuit, the magnetic circuit including:

a variable working air gap with which the armature is aligned for movement between an attracted position and a released position to actuate a recording element;

and a constant local passive air gap that is separate from and independent of the working air gap;

the driver assembly further comprising:

magnetic circuit connection means interconnecting all of the individual local magnetic circuits with their individual local passive air gaps in parallel, to form a constant common passive air gap;

and a permanent magnet connected to the magnetic circuit connection means, across the common passive air gap;

the common passive air gap being connected in series with the working air gap for each electromagnet and in parallel with the working air gaps for the permanent magnet, affording an effective shunt bypassing the permanent magnet for each electromagnet.

16. In a dot matrix line printer of the kind comprising N elongated dot print rods, each having a drive end and a print end, the print ends of the print rods being aligned in spaced relation to each other along a dot print line across a recording sheet of paper or the like at a print station, and drive means including N electromagnet armatures each connected to the drive end of a print rod, the improvement comprising:

a frame;

N armature support members, each comprising a cantilever spring having a fixed end anchored to the frame and a free end supporting one of the armatures;

a shuttle member parallel to but spaced from the dot print line;

N print rod support and guide members, each comprising a cantilever spring having a fixed end anchored to the shuttle member and a free end supporting the print end of one print rod, the print rod guide members being flexible and resilient only in a direction allowing axial motion of the print rods;

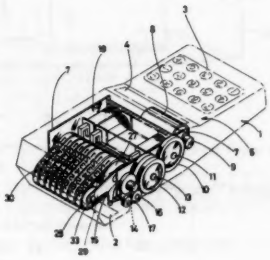
and two cantilever spring shuttle support arms, each having a fixed end anchored to the frame and a free end supporting one end of the shuttle, each support arm being resilient and flexible only in a direction parallel to the dot print line.

4,539,906

HAND-HELD PRINTER

Mitsuru Ogura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 23, 1981, Ser. No. 237,486
Claims priority, application Japan, Feb. 23, 1980, 55-22098; Feb. 23, 1980, 55-22099; May 30, 1980, 55-73931
Int. Cl.³ B41J 1/20
U.S. Cl. 101—93.14 10 Claims



1. A hand-held printer comprising:

a housing including an aperture formed in the bottom wall thereof;

a plurality of type carrying means for carrying a plurality of types mounted thereon, said plurality of type carrying means confronting said aperture formed in said housing;

first drive means for rotating said plurality of type carrying means in a first direction;

type selection means for stopping the rotation of said type carrying means when a desired type reaches a preselected position confronting said aperture while said type carrying means is driven to rotate in said first direction;

frame means for operatively retaining said plurality of type carrying means in a side-by-side relationship, said frame means being swingably mounted relative to said housing between a first position wherein said type selection means stops said type carrying means when a desired type reaches a Preselected position and a second position wherein said preselected types contact a record receiving means disposed below said housing through said aperture formed in said housing;

second drive means for shifting said frame means and said plurality of said type carrying means in a swinging motion downwardly from said first position where said selection operation is conducted to said second position where the preselected types make contact with said record receiving means; and

timing means for activating said second drive means after said type selection means completes said type selection operation to swing said frame and said plurality of said type carrying means downwardly wherein all of said preselected types automatically contact said record receiving means.

4,539,907

METHOD AND DEVICE FOR POSITIONING PRINTING CYLINDER AND INK-APPLYING ROLLERS IN A PRINTING MACHINE

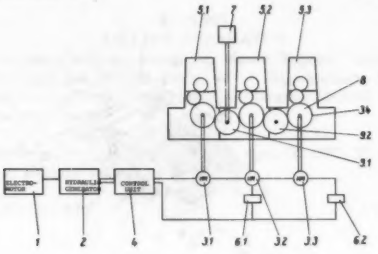
Hans Johne, Geschwister-Scholl-Str. 9, 8122 Radebeul; Arndt Jentzsch, Friedewaldstrasse 3a, 8270 Coswig; Herbert Doliner, Gröbener Str. 3, 8254 Niederau; Werner Frenzel, Weststrasse 40, 8122 Radebeul; Karl-Heinz Förster, Spitzwegstrasse 70, 8020 Dresden, and Johannes Naumann, Hermann-Matern-Str. 3a, 8270 Coswig, all of German Democratic Rep.

Filed Jan. 10, 1983, Ser. No. 456,754

Claims priority, application German Democratic Rep., Jun. 3, 1982, 240408

Int. Cl.³ B41F *13/12, 9/10*

U.S. Cl. 101—248 **3 Claims**



1. A method for positioning rotary components of a printing machine, particularly printing cylinders and application rollers, which machine has a main drive which is a decentralized drive and a plurality of printing units each driven by an individual drive motor connected to the main drive, and wherein positioning of the printing cylinders and application rollers is performed by an auxiliary drive during slow-down operation, or tipping operation or hand operation, the method comprising applying a portion of the initial breakaway torque required for the whole printing machine directly to individual motors of the assigned printing units, and producing the remaining portion of the torque, required for positioning of the printing cylinders and application rollers, by the auxiliary drive.

4,539,908

PRINTING UNIT WITH AN ELECTROSTATIC PRINTING AID COMPRISING ELECTRODES CONTAINED IN A LID STRUCTURE

Walter Spengler, Biel-Benken, Switzerland, assignor to Electronova S.A., Panama

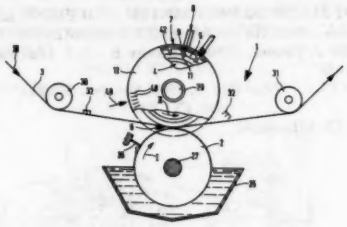
Filed Nov. 29, 1983, Ser. No. 555,950

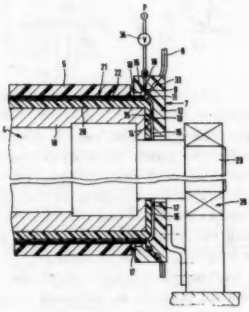
Claims priority, application Switzerland, Dec. 27, 1982, 7566/82

Int. Cl.³ B41M *1/10;* **B41F** *5/04, 9/00, 11/00*

U.S. Cl. 101—426 **12 Claims**

1. A printing unit comprising an electrostatic printing aid for assisting the transfer of ink from an impression cylinder onto a dielectric substrate web, and further comprising an inductor device concealed against outside access on at least one end face of an outer-shell layer of a back-up cylinder, said inductor being connected in operation with a high voltage source for the electrostatic charging of the outer shell layer, wherein the inductor device has at least one inductor electrode which is connected to a high-voltage supply and is aligned by means of an electrode tip with the edge of said end-face for the purpose of applying the electrostatic charge to said outer-shell layer in a contactless manner, wherein the inductor device (7) has an electrode carrier (12) in the form of a lid with inner face (13) which covers concentrically and conforms in shape to the outer end face (35) of the back-up cylinder (4) and end face edge (10) of its outer shell layer (5) over its entire periphery, in such a way that an annular air gap (15) is formed between the electrode carrier (12) and the outer end faces (35) of the back-up cylinder, and wherein in this annular air gap and located opposite the end-face edge of the outer-shell layer there is an





annular groove (16) in which are embedded several inductor electrodes (9), the electrode tips (11) of which, aligned with the end-face edge, project into the annular groove.

4,539,909

DETONATING ASSEMBLY WITH U-BEND OF LOW ENERGY DETONATING CORD

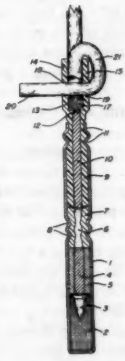
Philip R. Day, Toronto, and William K. Webster, Willowdale, both of Canada, assignors to C-I-L Inc., North York, Canada

Filed Aug. 23, 1983, Ser. No. 525,695

Claims priority, application Canada, Sep. 28, 1982, 412352

Int. Cl.³ C06C *5/04*

U.S. Cl. 102—275.2 **3 Claims**



1. A non-electric explosive detonator assembly comprising a

tubular shell closed at its bottom end, at least one explosive charge located in the bottom of said shell, an ignition charge adjacent to said explosive charge, a sealer element adjacent said ignition charge and a hollow tubular plug element adjacent said sealer element and within the said shell, the said hollow plug element having a portion extending beyond the open end of said shell, the said extended port i on comprising an integral, empty, substantially flat, U-shaped container having an internal dimension adapted to receive a U-bend of low energy detonating cord between spaced-apart faces, each of the said spaced faces having at a central loci a perforation therethrough aligned to receive an inserted free end length of the said low energy detonating cord, the said hollow plug element within the said shell having an initiation transmission charge therein, the said initiation transmission charge being separated from the said integral flat U-shaped container by a thin-walled, rupturable membrane.

4,539,910

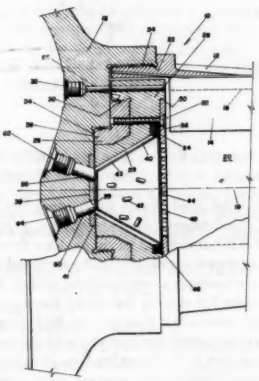
IGNITER PELLET CUP

George L. Stevens, Ogden, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Sep. 19, 1983, Ser. No. 533,167

Int. Cl.³ F42B *4/06*

U.S. Cl. 202—349 **7 Claims**



1. A rocket motor having a casing containing solid propellant and including an end cap and a closure for the casing, the closure being attached to the forward end of the casing and having an inner wall and an outer wall and including at least one port extending between the inner and outer walls with a through bulkhead initiator sealed in the port, the end cap being attached to the inner wall of the closure and having a cavity formed therein with the cavity in communication with the port, and further including an igniter comprising a plastic cup having a chamber containing ignition pellets and positioned in the cavity in the end cap with clearance between said plastic cup and the cavity being provided to allow leak test gas to bypass said cup and thus expose the seal of the through bulkhead initiator for leak checking.

4,539,911

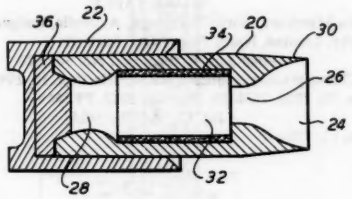
PROJECTILE

Abraham Flatau, Joppa, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 050,288, Jun. 20, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 335,306

Int. Cl.³ F42B *13/00*

U.S. Cl. 102—374 **7 Claims**



1. A ramjet projectile adapted to be launched from a gun barrel, consisting of:

a tubular housing having a forward air inlet with a throat, an aft nozzle, and a generally cylindrical combustion chamber contiguous therebetween

said inlet having a throat with a first predetermined cross-sectional area,

said forward air inlet having a sharp leading edge defining a forward-facing circular discoidal-shaped inlet with a second predetermined cross-sectional area,

said first area being at least 0.6 of said second area,

an annular layer of solid combustible material mounted in said housing between said inlet throat and said nozzle, and

said combustion chamber having a cross-sectional area larger than said first predetermined cross-sectional area.

4,539,912

CAR BRIDGING ARRANGEMENT FOR HIGH SPEED RAILWAY VEHICLES

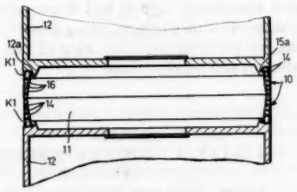
Helmut Hassel, Donauwörth, and Reimund Stark, Griesbeckerzell, both of Fed. Rep. of Germany, assignors to Messerschmidt-Böelkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,606

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1981, 3124682

Int. Cl.³ B60D *5/00*

U.S. Cl. 105—8 R **17 Claims**



1. A system for joining adjacent cars of a railway vehicle to provide an aerodynamically advantageous smooth outer surface therefor comprising: inflatable chamber bellows means extending essentially about the outer structure of the vehicle between the ends of adjacent cars, said bellows means being structured to define fluid-tight internal pressure chamber means capable of being pressurized to effect inflation of said bellows means; fluid pressure source means for supplying fluid pressure to said chamber means; and system control means responsive to operating characteristics of said railway vehicle

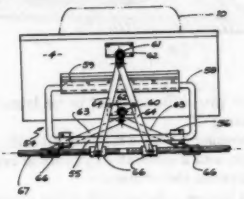
for controlling the supply of fluid pressure to said internal pressure chamber means from said fluid pressure source means in order to regulate the fluid pressure levels therein thereby to adjust physical characteristics of said inflatable chamber bellows means in accordance with changes in the operating characteristics of said vehicle.

4,539,913

WORK TABLE

John Marchant, North Narrabeen, Australia, assignor to Jeviti Pty. Limited, North Narrabeen, Australia

Filed Jun. 9, 1983, Ser. No. 502,623
Claims priority, application Australia, Jun. 10, 1982, PF4377; Jun. 30, 1982, PF4659; Aug. 18, 1982, PF5441
Int. Cl.³ A47B *27/02*
U.S. Cl. 108—7 **8 Claims**



1. A work table comprising:
a support frame;
a work surface operatively connected to said support frame;
a first caliper linkage having a first end and a second end, said first end being operatively connected to said work surface for vertically displacing and rotating said work surface about a horizontal axis in any vertical position;
a first leadscrew operatively connected to said support frame and to said second end of said first caliper for varying an included angle of the first caliper and thus the height of the connected work surface;
a second caliper linkage having a first end and a second end, said first end being operatively connected to said work surface at a point displaced from said first caliper linkage for vertically displacing and rotating said work surface about a horizontal axis in any vertical position;
a second leadscrew operatively connected to said support frame and to said second end of said second caliper for varying an included angle of the second caliper and thus the height of the connected work surface;
said first and second calipers and said first and second leadscrews operatively support said work surface relative to said support frame while providing a positive drive mechanism for adjusting the orientation of said work surface relative to said support frame.

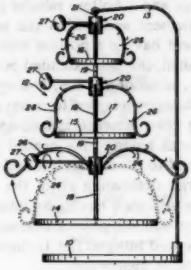
4,539,914

MULTI-LEVEL STAND, IN PARTICULAR MULTI-LAYER CAKES

Maurice Lebecque, 7222, rue Durocher - Apt. 9, Montreal, Quebec, Canada H3N 1Z9

Filed Sep. 27, 1982, Ser. No. 424,590
Int. Cl.³ A47B *57/00*
U.S. Cl. 108—94 **8 Claims**

1. A multi-level stand comprising a pair of vertically-spaced lower and upper shelves, a core member located between said shelves, a lower set and an upper set of decorative arms projecting from and positioned around said core member and pivoted up and down thereto into engagement with said lower shelf and with said upper shelf, respectively and the upper shelf is carried by the corresponding upper set of decorative arms for up-and-down displacement therewith and is carried with the corresponding upper set of decorative arms and core member by the corresponding lower set of decorative arms for up-and-down displacement therewith.

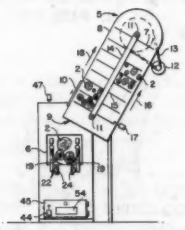


4,539,915

AUTOMATIC FEED DEVICE FOR SOLID FUEL BOILER, SPECIFICALLY FOR LOGS OF WOOD

Francis Bouron, 161 Rue de la Valette, 16000 Angouleme, France

Filed May 29, 1984, Ser. No. 614,747
Claims priority, application France, Sep. 14, 1983, 8314735
Int. Cl.³ F23N *5/18*
U.S. Cl. 110—101 R **9 Claims**



1. An automatic feed device for feeding logs and the like to a solid-fuel combustion chamber having a grate therein on which the fuel is burned and having a door through which fuel enters said combustion chamber to be dropped onto said grate, said device comprising storage means remote from said combustion chamber for storing fuel to be burned, carriage means for receiving successive charges of fuel from said storage means, conveyor means for moving said carriage means from said storage means to said combustion chamber, said carriage means having a cantilevered portion that carries a charge of fuel into said combustion chamber through said door to a limit position over said grate and that has means for thereafter discharging said charge of fuel therefrom to drop onto said grate, and automatic control means for detecting the state of combustion at said grate, for causing a charge of fuel in said storage means to be supplied to said carriage means, for causing said conveyor means to move said carriage means to said combustion chamber until said cantilevered portion is in said limit position, for then causing said discharging means to drop said charge of fuel from said carriage means to said grate, and for thereafter causing said conveyor means to return said carriage means to said storage means, said storage means including motor driven means for delivering successive charges of fuel to said carriage means step-by-step, said automatic control means including means for controlling the energization of said motor driven means, said conveyor means comprising a

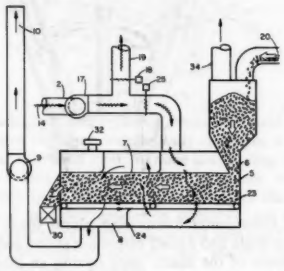
motor and said automatic control means including limit sensing means for controlling the motor of said conveyor means in response to said carriage means reaching limits of travel toward and away from said combustion chamber, respectively.

4,539,916

APPARATUS FOR CLEANING FLUE GASES AND OTHER GASES

John A. Paoluccio, 3530 Kiernan Ave., Modesto, Calif. 95356

Filed Aug. 11, 1983, Ser. No. 522,002
Int. Cl.³ F23J *15/00*
U.S. Cl. 110—203 **4 Claims**



1. A flue gas cleaning system for use with an associated biomass combustion system, which comprises:

means for holding, at least temporarily, a quantity of biomass fuel, said means for holding comprising a porous conveyor belt moving through said means for holding;

means for directing flue gas from the associated combustion system intermediate a plurality of biomass fuel particles or through a plurality of biomass fuel particles in said means for holding, said means for holding a quantity of biomass fuel being dimensioned and configured for cooperation with said means for directing flue gas; and

said means for directing including means bypassing said means for holding.

4,539,917

COMBUSTION HEATER FOR OIL SHALE

Richard G. Mallon; Otis R. Walton, both of Livermore; Arthur E. Lewis, Los Altos, and Robert L. Braun, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

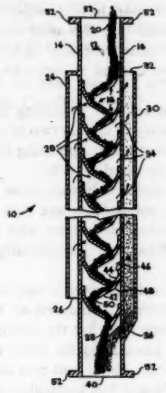
Filed Sep. 21, 1983, Ser. No. 534,427
Int. Cl.³ F23G *5/00*
U.S. Cl. 110—256 **8 Claims**

1. A combustion heater, comprising:

a vertical column having a pair of opposing sides;

a vertically spaced stack of alternately opposed overlapping downwardly sloped stationary solid baffles mounted in the column, successive baffles extending from opposing sides of the column, to produce a delayed continuous fall of a stream of material containing a combustible component through the column to produce segregation of particles in a layer of material by size as the material flows down one baffle, and an inversion of the layer as flow is reversed in passing to the next baffle, the baffles comprising a first segment having a slope, measured from the horizontal, in the range of about 24°–60° and a second segment joined to and above the first segment, the slope of the second segment being greater than the slope of the first segment, the stack of baffles being arranged so that the lower tip of one baffle is above and slightly offset from the junction between the first and second segments of the next baffle; and

a plurality of inlet ports and outlet ports in opposing sides of the column and below the baffles to provide a cross-flow of combustion supporting gas through the column to contact material as it falls through the column and support combustion of the combustible component to heat the



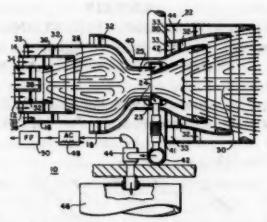
material, the ports being sufficient to provide combustion supporting gas substantially uniformly through the column and to allow sufficiently low output gas flux at each port to minimize removal of fine burned material.

4,539,918

MULTIANNULAR SWIRL COMBUSTOR PROVIDING PARTICULATE SEPARATION

János M. Beér, Winchester, Mass.; James A. Dilmore, Irwin, Pa.; Géza Vermes, Lower Merion Township, Montgomery County, Pa., and William E. Young, Churchill, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1984, Ser. No. 663,531
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—266 **6 Claims**



1. A two-stage rich-lean combustor operable with reduced emission of fuel-bound and thermal nitrogen oxide products (NO_x), said combustor comprising:

(a) a plurality of tubular members having differing axial lengths and disposed to form a burner basket of sufficient size and axial length to contain axially spaced rich and lean combustion zones;

(b) means for supporting said tubular members substantially coaxially and telescopically relative to each other to provide a generally annular path for inlet pressurized gaseous reactant or pressurized air flowing into said combustor with predetermined axial velocity between each tubular member and the next radially outwardly disposed tubular member;

(c) means for imparting a tangential velocity to gaseous reactant entering said combustor through each annular

flow path with the tangential velocity of at least the flows entering the rich combustion zone increasing with increasing flow radius;

(d) nozzle means for supplying fuel to said combustor in at least one predetermined location;

(e) said tubular members having respective axial lengths and being so disposed that the axial location of the tubular member outlet ends generally have increasing radii and respectively are located at successive downstream locations;

(f) said tangential velocity imparting means and the radial and axial geometry of at least two of said tubular members being coordinated under operating inlet gas pressure and gas axial velocity conditions to:

(1) define said rich combustion zone in an upstream portion of said combustor, where high temperature oxygen deficient combustion occurs with flame stabilizing recirculation flow and substantially without net NO_x formation;

(2) produce a toroidal vortex in said rich combustion zone, with recirculating combustion air being recuperatively supplied substantially by the swirling inlet annular air flow after it has cooled the inner wall surfaces of said tubular members about said rich combustion zone; and

(3) provide sufficient fuel particulate residence time in the rich combustion zone to permit particulate burning prior to centrifugal separation of particulates toward the combustor wall surface;

(g) said tangential velocity imparting means and the radial and axial geometry of at least two of said tubular members located outwardly from said tubular members about said rich combustion zone being coordinated under operating inlet gas pressure and gas axial velocity conditions to define said lean combustion zone and to produce a toroidal vortex in said lean combustion zone;

(h) said tubular members being arranged to provide a throat section into which said rich combustion zone converges and from which said lean combustion zone diverges; and

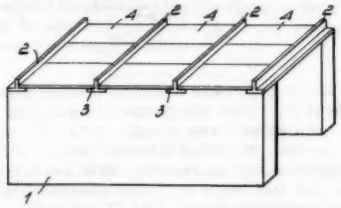
(i) means for collecting and withdrawing from said combustor particulates separated from the flow as it passes through said throat section.

4,539,919

SUPPORTING STRUCTURES FOR FURNACE CROWNS

Renato Bossetti, Novara, Italy, assignor to S.I.T.I. Società Impianti Termoelettrici Industriali S.p.A., Marano Ticino, Italy

Filed Jun. 25, 1984, Ser. No. 624,516
Claims priority, application Italy, Jul. 14, 1983, 22362/83[U]
Int. Cl.³ F23M *5/06*
U.S. Cl. 110—331 **5 Claims**



1. A furnace crown structure for furnaces used to fire ceramic materials at a high temperature, characterized in that it comprises silicon carbide beams:

said beamms being laid crosswise to the longitudinal axis of the furnace;

said beams being laid parallel to one another at constant pitch distances apart; and

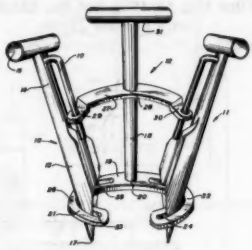
the spaces defined between said beams being closed with refractory material plates.

4,539,920

TRANSPLANTERS

Clement O. DuFrene, Cottage Grove, Minn., assignor to Gordon Rosenmeier, Little Falls, Minn., a part interest

Continuation-in-part of Ser. No. 526,965, Aug. 26, 1983. This application Sep. 28, 1983, Ser. No. 537,249
Int. Cl.³ A01G *23/06*
U.S. Cl. 111—2 **20 Claims**



1. A transplanter comprising plural spade members, each having a blade and a shaft extending above and attached to the top portion of the blade, each having an imaginary axis line along which the blade and shaft of the spade member extend, each said blade being curved with the center line of the arc of curvature lying substantiqlly in said axis line of said spade member, each said blade having substantially parallel lateral edges and a terminal edge tapering from said lateral edges toward the terminus of said blade, and a mainframe including a generally horseshoe-shaped base member having the arms of said horseshoe shape horizontally oriented for resting upon the surface of the earth, said arms being adapted fo receive therewithin the stem of a plant to be transplanted, base guide means consisting of arcuate slots in said base member for guiding the travel by the blades of said spade members, each said spade member being movable to effect slidable travel of its blade through a single said arcuate slot as an independent and separate matter from the movement of any other said spade member through any of the other of said arcuate slots, and upper guide means carried by said mainframe for guiding the travel by the shafts of said spade members, said upper guide means and said base guide means being in fixed spaced apart relationship to each other, said mainframe including a generally U-shaped upper frame member having arms in horizontal orientation above the respective arms of said base member, said upper frame member including a discreet said upper guide means for each spade shaft to guide the travel of the spade through a corresponding slot in the base member, whereby said spade members are held and guided by the upper guide means to pass through the slots in the base member along a line of travel in a direction substantially along the axis line of the spade members, with said lines of travel of said spade members intersecting at a point below the mainframe.

4,539,921

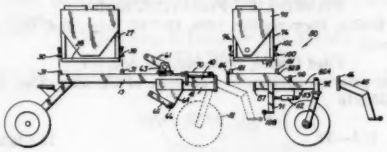
DRILL FRAME CONSTRUCTION

Ruben D. Morlock, Jamestown, N. Dak., assignor to Haybuster Manufacturing, Inc., Jamestown, N. Dak.

Filed Dec. 16, 1983, Ser. No. 562,271
Int. Cl.³ A01C *5/00*
U.S. Cl. 111—52 **6 Claims**

1. In a convertible frame for converting from a planting apparatus only to a combination planting apparatus and fertilizer side banding applicator wherein the convertible frame comprises a main frame member having rear support wheels, planting means mounted on said main frame member ahead of said rear support wheels for planting seed in rows spaced laterally across the machine, a removable caster wheel support mounted at the front portion of said main frame member, and

a removable hitch pole, the improvement comprising said main frame including a plurality of attachment plates fixed to the main frame member at transversely spaced locations, a side fertilizer band module frame having rearwardly facing transversely spaced plates corresponding in spacing to said forwardly facing plates on said main frame member and being positioned to mate with the forwardly facing plates when the hitch pole and caster wheel are removed from the main frame,



means to fasten said forwardly facing plates and said rearwardly facing plates together, respectively, to form a rigid frame assembly, the side band module frame also having means for attachment of said hitch pole, second caster wheels mounted on said side band module frame to support the main frame and side band module frame as an assembly, and a side banding fertilizer attachment mounted on said side band module frame and positioned to precede the planting means mounted on said main frame member.

4,539,922

NEEDLE BAR DRIVE FOR COUNTERBALANCED SEWING MACHINES

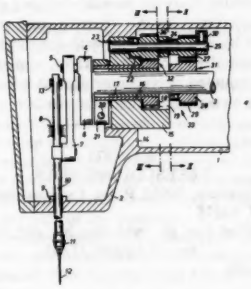
Kurt Klundt, Hirschhorn, Fed. Rep. of Germany, assignor to G.M. Pfaff AG, Fed. Rep. of Germany

Filed Oct. 16, 1984, Ser. No. 661,405

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341444

Int. Cl.³ D05B *55/14*

U.S. Cl. 112—221 **3 Claims**



1. In a sewing machine including an armshaft, a reciprocating needle driven by the armshaft and a first counterbalancing weight rotatably driven by the armshaft, the improvement comprising, a sleeve rotatably mounted on the armshaft, a gear affixed to said sleeve for rotation therewith, a second counterbalance carried by said sleeve and rotatable therewith, a cylindrical insert mounted in a sewing machine and rotatably supporting said sleeve, a counterbalanced shaft rotatably supported in said sleeve, a third counterbalance carried by said counterbalance shaft and rotatable therewith, first transmission gearing between said counterbalance shaft and said armshaft driving said counterbalance shaft from said armshaft and twice the speed of said armshaft for a ratio of 1:2 and in the same direction and second transmission gearing between said counterbalance shaft and said sleeve and driving said sleeve from said counterbalance shaft at half the rotational speed of the counterbalancing shaft for a ratio of 2:1 and in an opposite direction.

4,539,923

SELF-THREADING NEEDLE

Ballard E. Long, Oak Ridge, Tenn., assignor to A. LaSelva, Chattanooga; L. Lockard, Clinton and E. Roberts, Ten Mile, all of, Tenn.

Filed Apr. 16, 1984, Ser. No. 601,009

Int. Cl.³ D05B *85/02*

U.S. Cl. 112—224 **15 Claims**

1. An easy threading sewing needle or the like comprising a body member having a longitudinally elongated axis, a shank at one extemity of said body member adapted to be clamped in a sewing machine or the like, a blade extending from the shank and terminating in a pointed extremity remote from the shank, an eye adapted for receiving threads or the like comprising an aperture defined intermediate spaced wall portions of said blade and defining upper and lower eye surfaces, said eye having an axis of elongation substantially parallel to the axis of said needle extending through said upper and lower surfaces intermediate said wall portions, a longitudinally extending thread accomodating groove extending along a surface of said blade intermediate said wall portions and opening into said eye, a recess formed in the blade above the eye defining a hook receiving clearance on the surface of the needle disposed oppositely relative to said groove, a thread inlet slot formed transversely in the needle blade extending through one of said wall portions from one side of said needle substantially normal to said axes and opening into said eye, said one side being disposed intermediate the surfaces on which said groove and said recess are formed, said slot terminating intermediate the upper and lower extremities of said one wall portion of said eye closer to said upper surface than to said lower surface, and said pointed extremity terminating in a piercing point offset from the axis of elongation of said eye toward said one wall portion.

4,539,924

LOADING SYSTEM FOR A TOE CLOSING ASSEMBLY

Cecil R. Bell, Jr., Pinnacle; Willie M. Lathery, Germanton; Navin D. Patel, and Jasper R. London, both of Winston-Salem, all of N.C., assignors to Consolidated Foods Corporation, Winston-Salem, N.C.

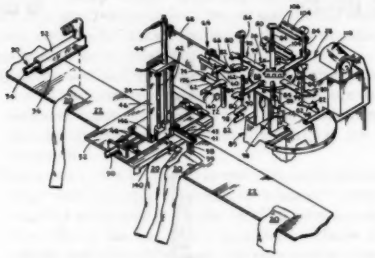
Filed Aug. 28, 1981, Ser. No. 297,315

Int. Cl.³ D05B *21/00, 97/00*

U.S. Cl. 112—262.2 **4 Claims**

1. The method of automatically conveying a series of tubular hosiery blanks, each having a welt end portion and a toe end portion to a plurality of toe-closing machines, each having sewing instrumentalities and a plurality of elongated support tubes for receiving the blanks and presenting the toe end por-

tions to the sewing instrumentalities comprising the steps of: conveying a series of hosiery blanks randomly discharged from a plurality of knitting machines to a predetermined location, sequentially discharging the blanks from the predetermined location onto a conveyor in a prescribed, oriented condition with the welt end portions selectively positioned upon the conveyor, conveying a plurality of the oriented blanks along a predetermined path, selectively removing the oriented blanks from the predetermined path by gripping the blank welt end



portion, displacing each blank welt end portion to a prescribed position spaced from said predetermined path, spreading open the welt end portion at said prescribed location, transferring the opened blank from said first prescribed location, and conveying the blank in an arcuate path while maintaining the welt end portion in an expanded condition to position the blank upon a tube, displacing the tube to present the blank toe end portion to the sewing instrumentalities, and sewing closed the blank toe end portion.

4,539,925

BI-DIRECTIONAL FEED DOG MECHANISM FOR SEWING MACHINE

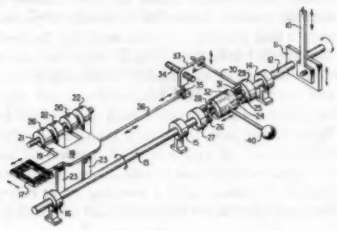
Peter B. S. Shim, 99 Midland Crescent, SE., Calgary, Alberta, Canada T2X 1N8

Filed May 31, 1984, Ser. No. 615,599

Claims priority, application Canada, Jun. 9, 1983, 430021

Int. Cl.³ D05B *27/02*

U.S. Cl. 112—314 **5 Claims**



1. In a sewing machine, in combination, feed dog means; support plate means for said feed dog means; a first connector arm means for producing horizontal backward and forward reciprocating movements of the feed dog and support plate; a second connector arm means for producing a horizontal sideways reciprocating movements of the feed dog and support plate; a rocker rod assembly mounted below said feed dog and support plate, including a pair of axially aligned rocker rods, one of said rocker rods being a powered rod and the other being a driven rod, said driven rod being operatively connected to said first connector arm and said powered rod being operatively connected to said second connector arm by way of a freely rotatable sleeve mounted on said powered rod; a clutch mechanism including a slideable member adapted in one position to operatively connect the two rocker rods thereby producing backward and forward reciprocating movements of the feed dog and in a second position to disconnect the two rocker rods and to operatively connect said freely rotatable sleeve to said powered rod thereby producing sideways reciprocating movements of the feed dog.

4,539,926

BOARD-LIKE FLOATING BODY

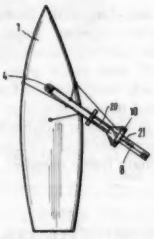
Jürgen Boffer, Biewerer Str. 168a, D-5500 Trier, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,781

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1982, 3246918

Int. Cl.³ B63B *39/02*

U.S. Cl. 114—39 **13 Claims**



1. In a board-like floating body having an elongated upper surface and a mast mounted thereon, a sail swingable relative to the mast and an outrigger swingable about an axis perpendicular to the upper surface of the floating body and having a seat for supporting an operator, the improvement comprising spring means biasing the outrigger to a rest position in which the outrigger extends longitudinally of the upper surface of the floating body, cable pull means connected between the outrigger and the floating body for manual swinging of the outrigger relative to such body by the operator, and steering control means carried by and swingable with the outrigger and positioned for manipulation by the operator, said steering control means being mounted on said outrigger at a location between said outrigger swinging axis and said seat.

4,539,927

TELESCOPING POLE

Robert R. Foresman, 26902 Paseo Cardero, San Juan Capistrano, Calif. 92675

Filed Apr. 15, 1983, Ser. No. 485,438

Int. Cl.³ B63B *15/00*

U.S. Cl. 114—89 **13 Claims**

1. An extendable pole comprising,

a first tube member (5),

a second tube member (2) axially disposed within said first tube member,

elongated drive means (1) conected to the opposite ends of said second tube member, and

guide means for supporting said elongated drive means relative to said first and second tube members,

said guide means includes first sheave means disposed adjacent one end of said first tube member, and

second sheave means disposed within said second tube member adjacent the other end of said first tube member,

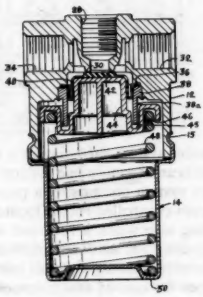
said elongated drive means arranged to pass around both of said first and said second sheaves.

4,539,928

TIRE EQUALIZER AND INDICATOR

Gordon R. Todhunter, Brentwood, and James W. Grim, Nashville, both of Tenn., assignors to Scovill Inc., Waterbury, Conn.

Filed Aug. 1, 1983, Ser. No. 519,031
Int. Cl.³ B60C *23/02*
U.S. Cl. 116—34 R **3 Claims**



1. A tire pressure equalizer and pressure indicator for dual tires comprising:

(a) a housing having an upper chamber and a lower chamber separated by a sealed diaphragm, the upper chamber having:

(1) a seat opposite the diaphragm, with a central opening, the diaphragm being adapted to seat and close off the seat,

(2) first passage means for connecting the seat opening and one tire,

(3) second passage means for connecting the upper chamber to the other tire, and

(4) fill means;

(b) an inverted cup underlying the diaphragm and radially extending well out beyond the margin of the diaphragm;

(c) spring means in the lower chamber engaging the cup and urging the cup and diaphragm toward seating disposition;

(d) an arm extending from the periphery of the cup longitudinally of the axis of the cup away from the spring means;

(e) rotary indicator means comprising a disc mounted for rotation in a side of the housing;

(f) the arm being formed with a transverse slot near its end and the disc having a pin affixed perpendicular thereto at a point spaced from the rotational axis of the disc, the pin passing through the slot whereby as pressure drops from a selected pressure, the diaphragm and cup driven by the spring, moves toward the seat and the indicator indicates a less-than-selected pressure, and when the diaphragm seats, isolating the two tires, the indicator indicates low pressure.

4,539,929

TEMPERATURE SENSITIVE RECLOSURE INDICATOR

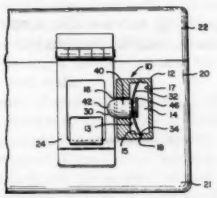
Joseph T. Sestak, and Dennis C. Coon, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Oct. 28, 1983, Ser. No. 546,313
Int. Cl.³ G01K *1/02*
U.S. Cl. 116—221 **3 Claims**

1. Apparatus in which articles can be sterilized and stored in a sterile condition comprising:

a container including a receptacle for holding the articles and a closure for said receptacle, said closure and said receptacle being movable, relative to each other, between an opened position, in which microbial life can enter said container and contact the articles, and a closed position, in which said closure and said receptacle prevent entry of microbial life into said container; and

an indicator assembly secured to said container, said indicator assembly including an indicator movable between two positions that are visually distinguishable from each other at least when the receptacle and closure assume their closed position, said indicator assembly including a temperature sensitive element, said element being so mounted to said indicator assembly that exposure of said element to an environment at a temperature falling within a predetermined range of temperatures for at least a predetermined length of time, when said indicator is in a first of its said positions, causes said element to move said indicator to a second of its said positions, subsequent exposure of said



element to an environment at a temperature falling ouside said predetemined temperature range being insufficient to cause said element to return said indicator to its said first position, subseqent exposure of said element to an environment as a temperature not falling within said predetermined temperature range for at least a predetermined period of time coupled with the exertion of a force against said indicator sufficient to cause said indicator to travel through at least a predetermined distance toward its said first position causing said indicator to assume its said first position and to remain in said first position after said force is removed from said indicator;

said container including means for exerting said force against said indicator to move said indicator through said predetermined distance each time said indicator is in its said second position and said closure and container are moved, relative to each other, from a said closed position to a said opened position.

4,539,930

CASTING AND COATING WITH METALLIC PARTICLES

Earl N. Stuck, Wareham, Mass., and Victor F. Zackay, New Canaan, Conn., assignors to Teledyne Industries, Inc., New Bedford, Mass.

Division of Ser. No. 532,537, Sep. 15, 1983, Pat. No. 4,486,470, which is a continuation-in-part of Ser. No. 427,900, Sep. 29, 1982, Pat. No. 4,405,296, which is a division of Ser. No. 300,224, Sep. 8, 1981, Pat. No. 4,374,789. This application Apr. 27, 1984, Ser. No. 604,972
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Int. Cl.³ B05B *1/02*
U.S. Cl. 118—300 **18 Claims**

1. A device for producing a metallic particle comprising:

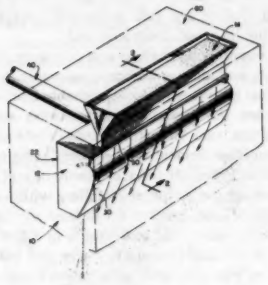
means defining a Coanda surface;

means for flowing a first fluid along said Coanda surface;

a second fluid located adjacent said Coanda surface to be influenced by the flow of said first fluid toward an intersection with said first fluid;

means for introducing a flow of molten metal between said first and second fluids to permit entrainment and associ-

ated breakup of said molten metal into metallic droplets; and



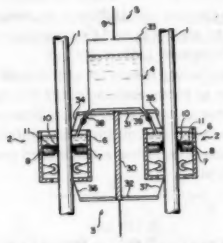
means for receiving said metallic droplets on a substrate which forms the metallic droplets into a coated or molded article.

4,539,931

COATING APPARATUS

Makoto Kikuta, and Hideo Terasawa, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Dec. 20, 1983, Ser. No. 564,083
Claims priority, application Japan, Dec. 28, 1982, 57-227533
Int. Cl.³ B05C *3/09*
U.S. Cl. 118—404 **6 Claims**



1. A coating apparatus comprising:

a coating vessel for containing a quantity of coating liquid, said vessel having a first hole therein for passing an object to be coated through the bottom thereof;

a support section supporting said vessel;

a sealing section disposed below said vessel having a second hole for receiving the object to be coated therethrough; said sealing section including

a brush in said second hole, having a third hole therein for receiving the object to be coated therethrough with the brush in contact with the exterior of the object to be coated, and an elastic member supporting said brush radially outside of said brush inside said second hole so as to urge said brush against the outside surface of the object to be coated, and

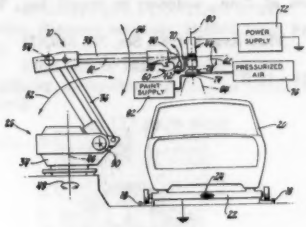
a drive means for moving said vessel, said support section and sealing section relative to the object to be coated passing through said first, second and third holes.

4,539,932

ROBOT PAINTING SYSTEM FOR AUTOMOBILES

Anthony M. Vecellio, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 481,119, Apr. 1, 1983,. This application Apr. 5, 1984, Ser. No. 597,017
Int. Cl.³ B05B *3/00, 5/00*
U.S. Cl. 118—697 **3 Claims**



1. A robot paint system for painting a series of automobile bodies movable in an assembly line fashion along a guide track, said robot paint system comprising a paint module having at least two program-controlled robots located therein, said paint module including side walls, a roof and an entrance opening and an exit opening for said automobile bodies, means for closing said entrance opening and said exit opening to provide a sealed chamber for one of said automobile bodies after the latter enters said paint module, each of said robots having an arm provided with a support head which is movable about five control axes, means for conveying said one of said automobile bodies along said guide track into said paint module via said entrance opening and for stopping and maintaining said one of said automobile bodies in a stationary and predetermined position relative to said paint module prior to and during the painting of said one of said automobile bodies, a bell-type atomizing device mounted on said support head of said arm and having a sufficiently small predetermined size to enable said atomizing device to apply paint to hidden surfaces of said one of said automobile bodies and be inserted within the inner compartment areas of said one of said automobile bodies, means for rotating the bell of said atomizing device about its spin axis at a speed in excess of 20,000 rpm to cause mechanical atomization of a liquid paint supplied to said atomizing device, means for creating an electrostatic field between said bell of said atomizing device and said one of said automobile bodies for causing the atomized liquid paint to be directed from said atomizing device to said one of said automobile bodies in a cone-shaped pattern, and control means for causing said support head of said arm to move the atomizing device about said five control axes to different positions along a path that follows the surface contours of said one of said automobile bodies at a predetermined distance therefrom and at a speed which due to said predetermined size in coaction with said robot will prevent any gyroscopic effect from distorting said cone-shaped pattern due to movement of said atomizing device about said five control axes.

4,539,933

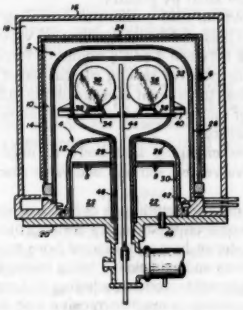
CHEMICAL VAPOR DEPOSITION APPARATUS

Bryant A. Campbell; Dale R. DuBois, both of Los Gatos; Ralph F. Manriquez, Saratoga, and Nicholas E. Miller, Cupertino, all of Calif., assignors to Anicon, Inc., San Jose, Calif.

Filed Aug. 31, 1983, Ser. No. 528,193
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—719 **19 Claims**

1. A controlled temperature deposition device comprising an inner deposition reaction chamber having gas distribution means for introducing gas into the inner chamber and removing gas therefrom, vacuum chamber means surrounding the inner deposition reaction chamber and spaced from the walls

thereof for maintaining a medium vacuum therein, the vacuum chamber means comprising a domed housing and a base cooperating therewith, the material of the domed housing and base being substantially transparent to rdiation, said radiant heating means being positioned over outer surfaces of the domed housing and base surrounding the inner deposition chamber for providing precisely controlled temperatures in the reaction chamber, the radiant heating means and the outer surface of



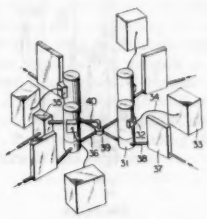
the domed housing and base being in a non-conducting relationship, wherein the domed housing has a domed housing base which engages a support plate, sealing means are positioned between the domed housing base and the support plate to form a vacuum seal, and cooling means engage the outer wall of the domed housing between the domed housing base and the portion thereof surrounding the inner deposition reaction chamber for removing heat therefrom.

4,539,934

PLASMA VAPOR DEPOSITION FILM FORMING APPARATUS

Yasutomo Fujiyama, and Shotaro Okabe, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,607
Claims priority, application Japan, Sep. 14, 1983, 58-168376
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—723 **1 Claim**



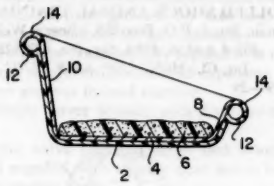
1. A vapor deposition film forming apparatus having a plurality of reactors each having a substrate and an electrode oppositely arranged in a vacuum chamber and means for applying a voltage thereacross to react or decompose reaction gas introduced into said vacuum chamber, wherein center axes of said reactors are arranged on the circumference of a circle and exhaust pipes having substantially equal exhaust resistance radially extend to said reactors from a common exhaust pipe located at the center of said circle.

4,539,935

COMBINATION PET BED AND ENCLOSURE

Fred Meyer, P.O. Box 66, Summerville, S.C. 29483

Filed Aug. 20, 1984, Ser. No. 642,648
Int. Cl.³ A01K *1/035*
U.S. Cl. 119—1 **3 Claims**



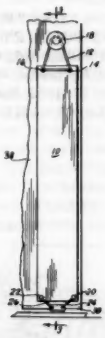
1. A combination pet bed and enclosure, comprising:
a. a pet bed portion having four walls with each of said walls joining two remaining walls at right angles, and being connected by a bottom side adjoining each of said walls, and further having a semi-cylindrical border around the perimeter of said walls;
b. a top enclosure of essentially the same size and shape as said pet bed portion so as to allow said pet bed portion to be inserted into said top enclosure, having a semi-cylindrical border inverted from that of said pet bed portion so that said semi-cylindrical borders of said pet bed portion and said top enclosure meet to form a cylinder when said top enclosure is inserted into said pet bed portion, and upon inverting and rotating said top enclosure 180 degrees, allowing said top enclosure to fit over and enclose said pet bed portion so as to be held in place by said semi-cylindrical borders fitting within each other.

4,539,936

ANIMAL DOOR SCRATCH PREVENTER

Frank Majewski, 6518 N. Oak Park Ave., Chicago, Ill. 60631

Filed Apr. 16, 1984, Ser. No. 600,412
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—29 **1 Claim**



1. A device for preventing a domestic animal from scratching the stile of the door below the handle, comprising a relatively thick plastic elongated strip, a cord secured to the upper end of said strip forming a loop to be placed over the doorknob, and strip having a pair of spaced apertures adjacent the lower end thereof, a pair of coil springs having two ends, one end of each spring secured in one of said apertures of said strip, a right angled rigid member having a pair of leaves, one extending vertically and the other right angled, the vertical leaf being provided with a pair of spaced apertures at the upper end

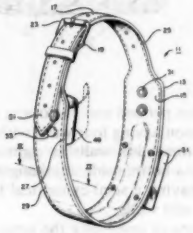
thereof into which the opposite ends of the springs are anchored, one in each aperture whereby the right angled leaf is placed under the bottom rail of the door to prevent dislodgement of the plastic strip.

4,539,937

CONTROLLED SHOCK ANIMAL TRAINING DEVICE

Edd Workman, Rte. 1, P.O. Box 253, Mineral Wells, Tex. 76067

Filed Aug. 6, 1984, Ser. No. 638,128
Int. Cl.[3] H05C *1/04*; A01K *15/02*
U.S. Cl. 119—29 **5 Claims**



1. A controlled shock animal training device, comprising:

a mounting strap for mounting said device about a portion of an animal's body;

a pair of electrical contacts spaced apart on said mounting strap; and

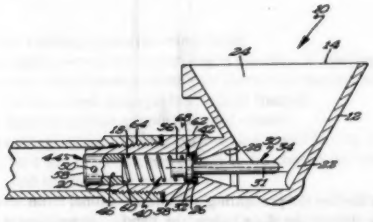
circuit means carried on said mounting strap and connecting said pair of spaced electrical contacts, said circuit means including a pressure actuated ribbon switch for opening and closing a circuit between said spaced electrical contacts in response to movement of said animal's body, and said circuit means further comprising integrated circuit means for applying a single, isolated shock to said animal each time said ribbon switch opens and is then reclosed to thereby provide a controlled voltage output through said contacts, said output being less than about 2 volts and lasting less than about 0.5 seconds in duration.

4,539,938

LEAK RESISTANT POULTRY WATERING DEVICE

M. C. Maranell, 1108 Village Rd., Chaska, Minn. 55318, and LeRoy A. Kortlever, Rochester, Wash.

Filed Dec. 27, 1983, Ser. No. 565,480
Int. Cl.[3] A01K *7/02*
U.S. Cl. 119—75 **2 Claims**



1. A leak resistant poultry watering device connectable to a water supply and selectively actuatable by poultry, comprising:

a rigid housing of waterproof, water impervious material, said housing including an upright water reservoir accessible to the chicken and having a top and bottom and a water entry conduit having a first end connectable to the water supply and a second end communicating with said reservoir;

said conduit including a valve seat therealong;

a valve confronting said valve seat and including a straight, elongated trigger shaft extending into said reservoir and accessible to poultry and having a valve disc therealong, said valve movable relative to said seat between a closed position against said seat and an open position having a gap between said valve and seat in response to movement of said trigger shaft by poultry;

a coil spring within said conduit and bearing against said valve disc to bias said valve against said valve seat with a biasing force between $\frac{1}{4}$ and $\frac{3}{4}$ pound of force against the valve disc for positive sealing of said valve disc against said valve seat to prevent leakage while still permitting movement of said trigger by poultry to allow water flow into said reservoir;

retaining means engaging said body to urge said spring against said valve disc and bias said valve disc against said valve seat;

said retaining means including a cylindrical sleeve having first and second ends and outwardly projecting detent means, said sleeve having a central bore to allow water flow therealong and said sleeve being insertable coaxially in said conduit, said conduit including at least one socket along said conduit channel to receive said detent means and retain said sleeve in said channel to bias said spring against said valve disc; and

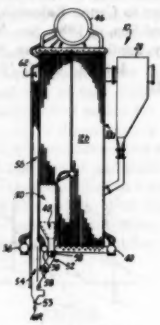
said detent means being positioned nearer said first end of said sleeve than to said second end to permit said sleeve to be reversibly receivable within said conduit to thereby provide two levels of spring compression to have a heavier spring tension and lighter tension, for adult and young chickens, respectively.

4,539,939

FLUIDIZED BED COMBUSTION APPARATUS AND METHOD

William B. Johnson, 522 Lewis Wharf, Boston, Mass. 02110

Continuation of Ser. No. 330,794, Dec. 15, 1981, abandoned.
This application Nov. 1, 1984, Ser. No. 667,075
Int. Cl.[3] F22B *1/02*
U.S. Cl. 122—4 D **44 Claims**



1. An improved fluidized bed combustion apparatus having a combustion chamber adapted to provide a fluidized bed of particulate matter, including combustible fuel particles, generally supported on a support member adapted to permit introduction of a fluidizing gas medium into the particulate matter and an inlet for introducing at least fresh combustible fuel particles into the fluidized bed, wherein the improvement comprises:

heat exchange means generally separated from the fluidized bed, said heat exchange means including flow communi-

cated up-flow and down-flow portions for permitting circulation of particulate matter from the fluidized bed, through said heat exchange means and back into the fluidized bed, said down flow portion including a discharge outlet adapted to direct any circulating particulate matter travelling downwardly through said down-flow portion in a generally horizontal direction over the fluidized bed; and

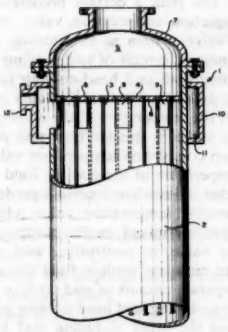
withdrawal means for withdrawing some of the particulate matter from the fluidized bed and introducing withdrawn particulate matter into said up-flow portion of said heat exchange means, said withdrawal means being located generally laterally distant from said discharge outlet so as not to be located directly below said discharge outlet, such that particulate matter leaving said discharge outlet is generally unaffected by any withdrawal forces generated by said withdrawal means and is permitted to exert a circulatory influence on the fluidized bed.

4,539,940

TUBE AND SHELL HEAT EXCHANGER WITH ANNULAR DISTRIBUTOR

Richard K. Young, c/o French, Hughes and Doescher, P.O. Box 2443, Bartlesville, Okla. 74005

Filed Apr. 26, 1984, Ser. No. 604,336
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—32 **20 Claims**



1. Apparatus for passing two fluids into indirect heat exchange relationship with each other comprising

(a) a shell,

(b) at least one tube sheet attached to the shell,

(c) a plurality of tubes piercing the tube sheet,

(d) an annular distributor surrounding the tube sheet and at least a portion of the shell, said annular distributor providing an annular space which extends in axial direction beyond the shell side surface of the tube sheet,

(e) a plurality of openings through said shell providing a fluid connection between the inside of said shell and said annular space, said openings extending all the way to the shell side surface of said tube sheet.

4,539,941

OSCILLATING PISTON ENGINE

Chin-Yen Wang, P.O. Box 10160, Taipei, Taiwan

Filed Dec. 28, 1983, Ser. No. 566,209
Int. Cl.³ F02B *53/06*
U.S. Cl. 123—18 R **6 Claims**

1. An oscillating piston engine comrpising:

a gas-exhaust end cover having an oil injection hole, an exhaust disc valve mounted atop on an upper cylinder cover with gas tightness and driven by an exhaust gear formed atop on a gas in-and-out control shaft which is lowerly engaged with an intersecting power transmission shaft, and said upper cylinder cover formed with four gas exhaust holes; each separated in equal radians;

a cylinder body having two kidney-like cylinders formed diagonally inside said cylinder body, each kidney-like cylinder having two combustion chambers provided with spark plugs and gas passages from a carburetor, and having two symmetrical internal extensions each formed with several expansion-plate grooves for inserting expansion plates and springs therein for gas tightness;

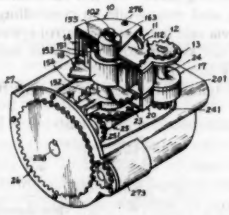
a wing-shaped piston symmetrically formed with two extensions on both sides each inserted with expansion plates and springs into grooves formed thereon;

a lower cylinder cover formed with four gas-inlet holes thereon;

a gas-inlet disc valve mounted under said lower cylinder cover and engaged with an inlet gear driven by said gas in-and-out control shaft;

an inlet end cover formed under said inlet disc valve and formed with a gas inlet to connect to a carburetor;

a wing-shaped spring plate engaged with a spline shaft formed under said piston and oscillatingly impacting on



both sides of an arcuated rebound block formed on a casing;

a bevel gear formed on the spline shaft of said piston and alternatively engaged with a pair of sector bevel gears separately formed on a power transmission shaft;

a fly wheel connected to said power transmission shaft and engaged with a starting motor; and

a casing covering the rotary engine, each of said pair of sector bevel gears formed as a semi-circle and formed with two open cutting ends of which one cutting end of one sector gear is separated from another cutting end of another sector gear with an acute angle when projectively viewed along said transmission shaft, whereby the rotation of said piston in one direction will drive said transmission shaft for rotary motion as said bevel gear under said piston engages with one sector bevel gear on said transmission shaft, and counter rotation of said piston will still drive said transmission shaft in the same rotary motion as said bevel gear under said piston engages with another sector bevel gear on said transmission shaft so as to convert the oscillating motion of said piston into a continuous rotary motion of said transmission shaft.

4,539,942

INTERNAL COMBUSTION ENGINE COOLING SYSTEM AND METHOD OF OPERATION THEREOF

Hideo Kobayashi; Takao Kashiwagi; Kunimasa Yoshimura, and Hisao Mae, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 18, 1984, Ser. No. 662,052
Claims priority, application Japan, Nov. 25, 1983, 58-221521
Int. Cl.³ F01P *3/04, 5/02*
U.S. Cl. 123—41.1 **20 Claims**

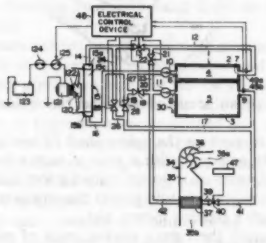
1. A cooling system, for an internal combustion engine cooled by flow of cooling fluid and comprising a cylinder head and a cylinder block, comprising:

(a) a cylinder head cooling jacket through which cooling fluid circulates to cool said cylinder head;

(b) a cylinder block cooling jacket through which cooling fluid circulates to cool said cylinder block;
(c) a radiator;
(d) a cooling fan system for blowing air at said radiator;
(e) a fan system control system which controls said cooling fan system so that it blows air at said radiator either at a relatively high flow amount or at a relatively low flow amount;
(f) a cooling fluid conduit system for circulating cooling fluid through said head cooling jacket, said block cooling jacket, and said radiator in various selectable flow patterns;
(g) a control valve system for thus selectably controlling said circulating flow of controlling fluid in said cooling fluid conduit system;

and

(h) a control system for:
(h1) if the temperature of the cooling fluid in said block cooling jacket is less than a certain predetermined engine warmup completion temperature value, so controlling said control valve system as to circulate cooling fluid through a combined circuit of said cooling fluid conduit system including both said head cooling jacket and said block cooling jacket but not substantially including said radiator, and meanwhile so controlling said cooling fan system, via said fan system control system, as to cause said cooling fan system to blow air at said radiator at said relatively low flow amount;
(h2) if the temperature of the cooling fluid in said block



cooling jacket is greater than said predetermined engine warmup completion temperature value, then:
(h21) if the temperature of the cooling fluid in said block cooling jacket is less than a certain predetermined engine overheating temperature value which is higher than said predetermined engine warmup completion temperature value, so controlling said control valve system as to circulate cooling fluid through two substantially separate circuits of said cooling fluid conduit system, one including said head cooling jacket and said radiator, and the other including said block cooling jacket without substantially including said radiator;
(h22) if the temperature of the cooling fluid in said block cooling jacket is greater than said predetermined engine overheating temerature value, so controlling said control valve system as to circulate cooling fluid through a combined circuit of said cooling fluid conduit system including said head cooling jacket and said block cooling jacket and also substantially including said radiator;

and

(h3) if the temperature of the cooling fluid in said block cooling jacket is greater than a predetermined block fan system trigger temperature value which is equal to or slightly higher than said predetermined engine warmup completion temperature value, then:
(h31) if the temperature of the cooling fluid in said head cooling jacket is less than a certain predetermined head fan system trigger temperature value which is less than said predetermined engine warmup completion temperature value, so controlling said cooling fan system, via said fan system control system, as to cause it to blow air at said radiator at said relatively low flow amount;

and

(h32) if the temperature of the cooling fluid in said head cooling jacket is greater than said predetermined head fan system trigger temperature value, so controlling said cooling fan system, via said fan system control system, as to cause it to blow air at said radiator at said relatively high flow amount.

16. A method of operating a cooling system, for an internal combustion engine cooled by flow of cooling fluid and comprising a cylinder head and a cylinder block, comprising (a) a cylinder head cooling jacket through which cooling fluid circulates to cool said cylinder head; (b) a cylinder block cooling jacket through which cooling fluid circulates to cool said cylinder block; (c) a radiator; (d) a cooling fan system for blowing air at said radiator; (e) a fan system control system which controls said cooling fan system so that it blows air at said radiator either at a relatively high flow amount or at a relatively low flow amount; (f) a cooling fluid conduit system for circulating cooling fluid through said head cooling jacket, said block cooling jacket, and said radiator in various selectable flow patterns; and (g) a control valve system for thus selectably controlling said circulating flow of cooling fluid in said cooling fluid conduit system;

said method comprising the processes, simultaneously performed, of:
(h) if the temperature of the cooling fluid in said block cooling jacket is less than a certain predetermined engine warmup completion temperature value, so controlling said control valve system as to circulate cooling fluid through a combined circuit of said cooling fluid conduit system including both said head cooling jacket and said block cooling jacket but not substantially including said radiator; but if the temperature of the cooling fluid in said block cooling jacket is greater than said predetermined engine warmup completion temperature value:
(h1) if the temperature of the cooling fluid in said block cooling jacket is less than a certain predetermined engine overheating temperature value which is higher than said predetermined engine warmup completion temperature value, so controlling said control valve system as to circulate cooling fluid through two substantially separate circuits of said cooling fluid conduit system, one including said head cooling jacket and said radiator, and the other including said block cooling jacket without substantially including said radiator;
or (h2) if the temperature of the cooling fluid in said block cooling jacket is greater than said predetermined engine overheating temperature value, so controlling said control valve system as to circulate cooling fluid through a combined circuit of said cooling fluid conduit system including said head cooling jacket and said block cooling jacket and also substantially including said radiator;

and

(i) if the temperature of the cooling fluid in said block cooling jacket is less than a predetemined block fan system trigger temperature value which is equal to or slightly higher than said predetermined engine warmup completion temperature value, then so controlling said cooling fan system, via said fan system control system, as to cause said cooling fan system to blow air at said radiator at said relatively low flow amount; but if the temperature of the cooling fluid in said block cooling jacket is greater than said predetermined block fan system trigger temperature value, then:
(i1) if the temperature of the cooling fluid in said head cooling jacket is less than a certain predetermined head fan system trigger temperature value which is lower than said predetermined engine warmup completion temperature value, so controlling said cooling fan system, via said fan system control system, as to cause it to blow air at said radiator at said relatively low flow amount;

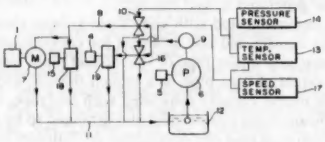
or (i2) if the temperature of the cooling fluid in said head cooling jacket is greater than said predetermined head fan system trigger temperature value, so controlling said cooling fan system, via said fan system control system, as to cause it to blow air at said radiator at said relatively high flow amount.

4,539,943

ENGINE COOLING SYSTEM

Shunzo Tsuchikawa, and Yasuhiro Kawabata, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 9, 1984, Ser. No. 639,224
Claims priority, application Japan, Sep. 20, 1983, 58-172255; Sep. 20, 1983, 58-172256; Sep. 20, 1983, 58-172257
Int. Cl.³ F01P *5/04, 11/10*
U.S. Cl. 123—41.05 **10 Claims**



1. An engine cooling system for use in an automobile, comprising:

(a) an engine having an output shaft;

(b) a radiator;

(c) a cross-flow fan disposed adjacent to said radiator and having a rotatable shaft;

(d) a hydraulic motor coupled to said rotatable shaft of said cross-flow fan;

(e) a hydraulic pump driven by said output shaft of the engine and connected to said hydraulic motor for supplying oil under pressure to the hydraulic motor to rotate said rotatable shaft of the cross-flow fan;

(f) a return passage interconnecting said hydraulic motor and said hydraulic pump;

(g) a supply passage interconnecting said hydraulic pump and said hydraulic motor;

(h) a directional control valve disposed in said supply passage for selectively connecting said supply passage to said return passage in bypassing relation to said hydraulic motor;

(i) a temperature sensor for sensing the temperature of engine cooling water, said directional control valve being controlled by a signal from said temperature sensor;

(j) a second directional control valve connected parallel to said first-mentioned directional control valve for selectively connecting said supply passage to said return passage;

(k) a movable shroud for controlling a flow of air toward said cross-flow fan;

(l) a radiator shutter disposed between said radiator and said cross-flow fan; and

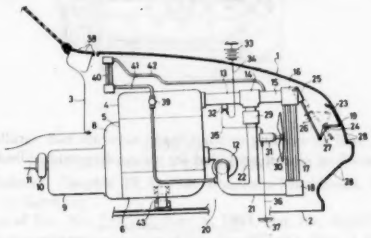
(m) hydraulic means connected between said supply passage and said return passage for actuating said radiator shutter and said movable shroud, respectively.

4,539,944

TEMPERATURE-CONTROLLING SYSTEM FOR THE LIQUID COOLANT OF A MOTOR CAR INTERNAL-COMBUSTION ENGINE

Giampaolo Garcea, and Filippo Surace, both of Milan, Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy

Filed Apr. 1, 1982, Ser. No. 364,313
Claims priority, application Italy, Apr. 6, 1981, 20948 A/81
Int. Cl.³ F01P *5/06, 7/16*
U.S. Cl. 123—41.06 **4 Claims**



1. A system for controlling the temperature of the liquid coolant for a motor car internal combustion engine of a kind comprising: a radiator connected to the engine cylinder block by an inlet duct and an outlet duct for the liquid coolant, said inlet duct and said outlet duct being interconnected by a third duct which by-passes the radiator, a control valve in said third duct for controlling the flow of liquid coolant through said third duct, a circulating pump for said liquid coolant, a cooling fan for said radiator which also receives an airflow coming from a primary port and a secondary port through the car body for directing air to and through said radiator, said cooling fan having a controllable drive and there being a vane for controlling airflow through said primary port, said vane having a positioning mechanism, said systems including a sensing device for sensing three temperature levels of the liquid coolant in the outlet duct from the cylinder block; said sensing device including means for sensing a first temperature of a predetermined level and in response to the temperature sensing positioning the valve which controls the flow of the liquid through said third by-pass duct, means for sensing a second temperature having a level above the level of the first temperature and being operatively connected to said controllable drive for controlling actuation of said fan drive, and means for sensing a third temperature which is at a level between the levels of said second temperature and said first temperature and connected to said vane positioning mechanism to control the position of said vane and thereby control the flow of air to said radiator through said car body primary port.

4,539,945

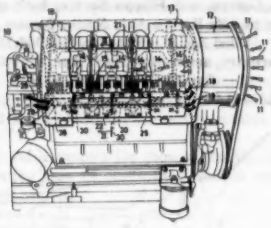
INTERNAL COMBUSTION POWER PACK WITH INJECTION PUMP VENTILATION SYSTEM

Roberto Bosisio, Treviglio, Italy, assignor to SAME S.p.A., Treviglio, Italy

Filed May 23, 1984, Ser. No. 613,208
Claims priority, application Italy, May 31, 1983, 22002/83[U]
Int. Cl.³ F02B *77/00*
U.S. Cl. 123—41.31 **4 Claims**

1. An internal combustion power pack, for a diesel engine comprising cylinders in an engine block and a fuel injector assembly, which are cooled by cooling air, characterized by the fact that provision is made for means for feeding and expelling part of said cooling air to and from said fuel injector assembly which are separate from the remaining part of the cooling air, said means comprise a casing removably mounted

on said engine block adjacent said injector assembly and defining an air cooling conduit for air cooling said injector assembly, said air cooling conduit being separate and parallel to an air cooling circuit provided for air cooling said cylinders.



4,539,946

METHOD OF CONTROLLING THE COMBUSTION CYCLE IN A COMBUSTION ENGINE

Lars G. B. Hedelin, Skärsnäsvägen 5, S-182 63 Djursholm, Sweden

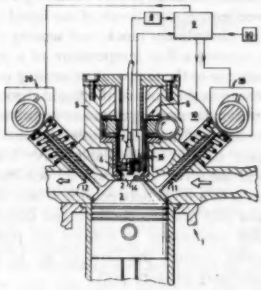
PCT No. PCT/SE82/00275, § 371 Date Apr. 28, 1983, § 102(e) Date Apr. 28, 1983, PCT Pub. No. WO83/00901, PCT Pub. Date Mar. 17, 1983

PCT Filed Sep. 6, 1982, Ser. No. 492,030

Claims priority, application Sweden, Sep. 7, 1981, 8105302

Int. Cl.³ F02D *15/04*

U.S. Cl. 123—48 A **6 Claims**



1. A method of controlling the combustion cycle in an internal combustion piston engine in which a gaseous working medium is compressed, is combusted and performs work, and in which the compression ratio is varied during operation, comprising:

regulating the amount of working medium by operating the engine to draw in a maximum amount of working medium corresponding, to full gas operation and then causing a portion of the working medium to flow out again without being compressed;

retaining and compressing an amount of the working medium proportional to the current load; and

regulating the compression ratio as a function of the amount of working medium retained to obtain a substantially constant compression pressure under varying operating conditions.

4,539,947

RESONATOR FOR INTERNAL COMBUSTION ENGINES

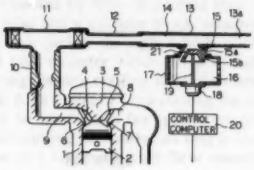
Toshiichi Sawada, Kariya; Yasuhiko Fukami, Nishikasugai, and Shuzo Kinkori, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 8, 1983, Ser. No. 559,242

Claims priority, application Japan, Dec. 9, 1982, 57-216336; Dec. 9, 1982, 57-216338; Dec. 13, 1982, 57-218822

Int. Cl.³ F02B *27/02;* **F02M** *35/10*

U.S. Cl. 123—52 M **7 Claims**



1. A resonator for an internal combustion engine having conduit means defining a gas flow path to and from a cylinder having a movable piston, this conduit means including an intake pipe leading to the cylinder and an exhaust pipe leading from the cylinder,

said resonator, comprising:

wall means defining a closed volume chamber for absorbing noise generated in said engine;

a tube communicated with said closed volume chamber and being constructed and arranged for communication with at least said intake pipe of one of said pipes intermediate the extent of such pipe, as a branch thereof; and

throttle means variably associated with said tube, this throttle means being constructed and arranged to be moved in relation to at least one operational condition of said engine for correspondingly varying the resonant frequency thereof by substantially varying at least one dimensional factor of said resonator in order to absorb engine noise over a broader range of engine speeds than would result from unvarying communication of said tube with said closed volume chamber and respective said pipe.

4,539,948

TWO-CYCLE DIESEL ENGINE AND METHOD FOR METHANOL AND LIKE FUEL OPERATION

Richard R. Toepel, Farmington Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 11, 1984, Ser. No. 609,122

Int. Cl.³ F02B *33/38*

U.S. Cl. 123—65 BA **6 Claims**

1. A two-stroke cycle diesel engine adapted for compression ignition operation on liquid fuels, said engine comprising

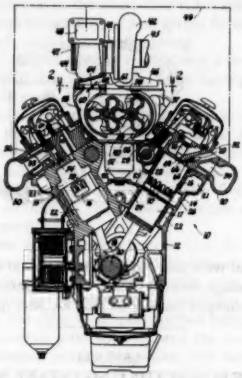
a plurality of cylinders having pistons operable on a two-stroke cycle including compression and power strokes to supply power to an output member and permit through-flow cylinder scavenging at the end of each power stroke,

an air supply blower connected to the cylinders to supply scavenging air thereto

injection means to inject liquid fuel into each cylinder near the end of its piston compression stroke for compression ignition and burning of the fuel in a compressed charge, the compression ratio of the engine being inadequate in at least some portion of the normal operating range to raise a full cylinder charge of ambient air to a temperature capable of reliably igniting the injected fuel without substantial preheating or precompression of the cylinder charge, and

means limiting the flow of scavenging air to the cylinders in at least a portion of the engine operating range to provide a cylinder scavenging ratio of sufficiently less than 1.0 to produce a heating effect of residual exhaust gases remain-

ing in the cylinder that will raise the charge temperature to a point where reliable self-ignition of the fuel will occur



substantially upon its injection into the compressed cylinder charge.

4,539,949

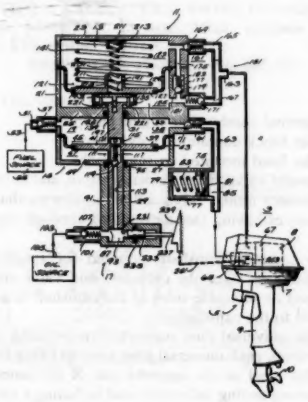
COMBINED FLUID PRESSURE ACTUATED FUEL AND OIL PUMP

Frank J. Walsworth, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 309,558, Oct. 8, 1981, Pat. No. 4,381,741, and a continuation-in-part of Ser. No. 314,224, Oct. 23, 1981, Pat. No. 4,473,340, and a continuation-in-part of Ser. No. 324,145, Nov. 23, 1981, Pat. No. 4,383,504. This application Aug. 23, 1982, Ser. No. 410,497

Int. Cl.[3] F01M *3/00*

U.S. Cl. 123—73 AD 5 Claims



1. An internal combustion engine comprising a crankcase subject to conditions or relatively high and low pressure which alternate in a crankcase pressure cycle having a frequency and an amplitude which vary in accordance with variation in engine speed, and a pressure actuated motor comprising a housing, a movable wall located in said housing and dividing said housing into low and high pressure chambers which inversely vary in volume relative to each other, and means for causing reciprocation of said movable wall with a stroke having a frequency which differs from the crankcase pressure cycle frequency and having a length which varies in accordance with variation in the crankcase pressure cycle amplitude and including means connecting the crankcase to the low and high pressure chambers so as to create therebetween a pressure differential having an amplitude which varies in accordance with variation in crankcase pressure cycle amplitude.

4,539,950

FOUR-STROKE PISTON ENGINE

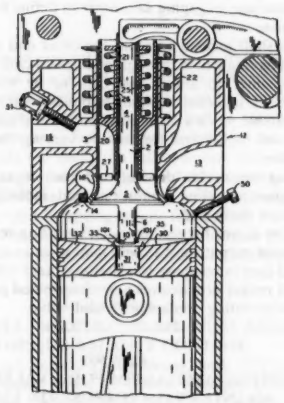
Josef Schaich, Oeschle 20, D-7906 Blaustein-Markbronn, Fed. Rep. of Germany

Division of Ser. No. 318,738, Nov. 6, 1981, Pat. No. 4,450,796, which is a continuation-in-part of Ser. No. 957,661, Nov. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 854,904, Nov. 25, 1977, abandoned, which is a continuation of Ser. No. 643,165, Dec. 22, 1978, abandoned. This application Apr. 23, 1984, Ser. No. 602,682

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529074

Int. Cl.[3] F01L *1/28;* F02B *3/00*

U.S. Cl. 123—79 C 1 Claim



1. A method of forming an ignitable fuel-air mixture in a four-stroke internal combustion engine having a piston and cylinder with a combustion space wherein the air flowing into the cylinder is caused to rotate about the longitudinal axis of the cylinder and wherein a quantity of fuel is blown or injected into the air flowing in the region between an inlet valve and a recess in the piston by means of at least one fuel delivery device, a fuel passage and at least one nozzle connected to said fuel passage, said nozzle being provided in the region of the longitudinal axis of the cylinder and in the lower region of the compression space and being carried by a nozzle carrier which is installed in the inlet valve and also carries the ignition device, and said quantity of fuel is blown or injected into said air just before ignition takes place to form a zone of ignitable mixture in the region of the recess in the piston of a volume which is relatively small compared with the volume of the total mixture.

4,539,951

VARIABLE VALVE TIMING MECHANISM

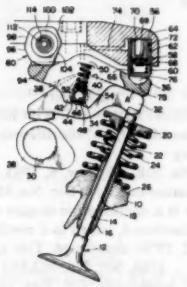
Seinosuke Hara, Yokosuka; Kazuyuki Miisho; Yasuo Matsumoto, both of Yokohama, and Yasuo Yoshikawa, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 19, 1984, Ser. No. 632,340

Claims priority, application Japan, Jul. 21, 1983, 58-134077; Apr. 24, 1984, 59-81052

Int. Cl.³ F01L *1/34, 1/04, 13/00*

U.S. Cl. 123—90.17 **25 Claims**



1. A variable valve timing mechanism for a valve of an internal combustion engine, comprising:

a lever pivotally mounted at one end thereof;

a rocker arm engaging said lever to define fulcrum therebetween;

a cam shaft located adjacent the other end of said lever;

a cam having a hole through which said cam shaft extends in a manner to allow said cam to be rotatable relative thereto, said cam engaging said other end of said lever and rotatable to vary an angular position of said lever relative to said rocker arm for thereby varying the timing of said valve;

driving means for driving said cam in accordance with engine operating conditions and including a rotatable output shaft; and

resilient means for resiliently transmitting rotational motion of said output shaft to said cam so as to cause rotation of said cam in response to rotation of said output shaft when said rocker arm assures a predetermined position being in non-actuating contact with said valve.

4,539,952

SUPPORTING MECHANISM FOR A VALVE SYSTEM OF AN INTERNAL-COMBUSTION ENGINE

Yasushi Nouno; Masami Konishi, and Yoshio Sasaki, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

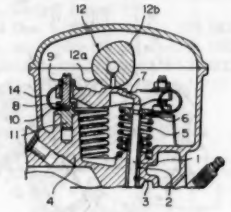
Filed Nov. 15, 1984, Ser. No. 671,508

Claims priority, application Japan, Nov. 17, 1983, 58-215041

Int. Cl.³ F01L *1/20*

U.S. Cl. 123—90.36 **6 Claims**

1. In a supporting mechanism for a valve system of an internal-combustion engine, said valve system having a support member provided on a cylinder head of said engine, a rocker arm swingably supported by said support member, an intake or exhaust valve opening or closing a port formed in said cylinder head, and means for swinging said rocker arm so that said valve opens or closes said port, said supporting mechanism comprising said support member having a downwardly concave support surface and an outer surface thereof, a spherical projection provided on said rocker arm and placed on said support surface in such a manner that said spherical surface is in slidable contact with said support surface, and means for connecting said spherical projection to said support member, characterized in that said support member has a recess for holding sludge on a lower portion thereof, said recess being



communicated with said outer surface of said support member through a passage formed in said support member so that said sludge is discharged outside of said support member.

4,539,953

APPARATUS FOR ACTUATING INTAKE AND EXHAUST VALVES IN INTERNAL COMBUSTION ENGINE

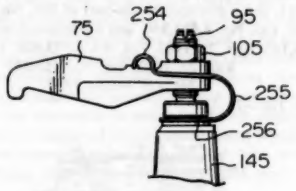
Yoshio Sasaki, Toyota, and kazuyuki Saito, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 460,021, Jan. 21, 1983, abandoned. This application Oct. 12, 1984, Ser. No. 659,869

Claims priority, application Japan, Jan. 25, 1982, 57-8799

Int. Cl.³ F01L *1/46*

U.S. Cl. 123—90.41 **1 Claim**



1. An internal combustion engine comprising

a cylinder block containing a cylinder;

a cylinder head mounted on said block;

a main intake valve, a main exhaust valve, and at least one of an auxiliary intake valve and an auxiliary exhaust valve, said valves having stems extending through the cylinder head;

a single common camshaft mounted for rotation on the cylinder head over the cylinder, said valve stems being disposed on alternate sides of the camshaft in a direction parallel to the camshaft;

a separate universal joint support corresponding to each of said valves, each universal joint support being fixed to the cylinder head on the opposite side of the camshaft from the corresponding valve stem and including a socket at the upper end thereof;

a rocker arm for each valve, each rocker arm having one end pivotally mounted on the corresponding universal joint support and having an opposite end engageable with the stem of the corresponding valve;

a cam of said camshaft for each valve, each cam contacting the respective rocker arm intermediate the ends thereof for pivotally oscillating the rocker arm about the corresponding support;

means for preventing rotation of each rocker arm on said corresponding universal joint support out of contact with the corresponding valve stem, said means comprising said other end of each rocker being bifurcated to extend

closely along opposite sides of the free end of the valve stem;

means for continuously biasing each rocker arm into contact with the free end of the associated valve stem, said biasing means comprising a keeper leaf spring formed from sheet spring stock, said leaf spring having

an open U-shaped portion comprising a first curved section joining first and second arms having spaced apart outer free ends,

a closed U-shaped portion comprising a second curved section joining third and fourth arms having spaced apart outer ends and a cross member joining the outer ends of the third and fourth arms, and

an intermediate portion joining the first and second curved sections of the respective open and closed U-shaped portions,

said intermediate portion being bent so that the outer ends of the first and second arms of the open U-shaped portion extend toward the ends of the third and fourth arms of the closed U-shaped portion in the unstressed condition, the first and second arms of the open U-shaped portion being engaged in a slot on said universal joint support, and the cross member of the closed U-shaped portion engaging and being stressed to bear downward on the top of the rocker arm at a location spaced from the pivot point at the one end of the rocker arm toward the other end thereof; and

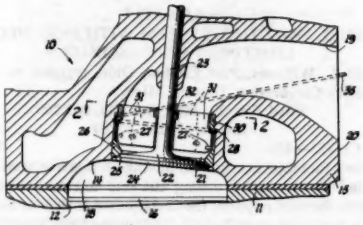
means for adjusting the rocker arm clearance, said adjusting means comprising an adjusting screw mounted in a threaded hole in the one end of the rocker arm, the adjusting screw having a ball head at one end engaging said socket in the corresponding universal joint support and a single cross-slot at the other end, and a locknut screwed on the other end of the adjusting screw and bearing against the top of the rocker arm, wherein said closed U-shaped portion of the keeper leaf spring extends around the one end of the rocker arm below the level of the locknut, whereby the keeper leaf spring does not interfere with lash adjustment of the rocker arm.

4,539,954

SELECTIVE ASYMMETRIC SWIRL INTAKE PORT

Edward D. Klomp, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1984, Ser. No. 665,712
Int. Cl.³ F01L *3/06*
U.S. Cl. 123—188 VA **4 Claims**



1. The combination in an internal combustion engine of

a cylinder having a peripheral wall and a closed end,

means defining an intake port opening to the cylinder through the closed end, the port having an end portion adjacent to the cylinder with an edge near the peripheral wall,

a poppet valve in the port reciprocably supported by the port defining means and engageable with the port defining means near the cylinder closed end for movement of the valve into open and closed positions to open and close communication between the port and the cylinder, and

adjustable swirl means in said port end portion, said swirl means comprising a plurality of adjustable vanes supported in annularly spaced relation around said valve in said port end portion and extending in directions generally outwardly from the valve and longitudinally along the direction of flow through the port end portion and

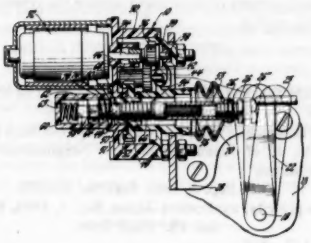
adjusting means to selectively adjust said vanes between open and flow restricting positions, said adjusting means providing sequential opening of at least certain of the vanes to impart varying degrees of swirl to fluid charges entering the cylinder through the intake port.

4,539,955

IDLE SPEED CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Robert E. Wilson, Beaver Creek, and Gustavus P. Bock, Bellbrook, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 6, 1984, Ser. No. 648,037
Int. Cl.³ F02D *11/10*
U.S. Cl. 123—339 **3 Claims**



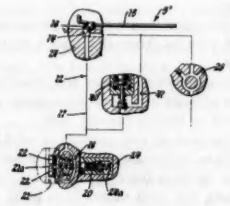
1. An idle speed control device for an internal combustion engine controlled by a throttle wherein the device has a throttle stop positioning shaft for the throttle and a threaded drive gear that engages threads on the shaft and on turning in one direction retracts the shaft and on turning in the opposite direction extends the shaft to a full extension position where the gear disengages from the shaft and then can freewheel in said opposite direction without forcing further extension of the shaft, characterized by spring means for forcibly re-engaging the gear with the shaft when the gear is turned in said one direction to initiate retraction of the shaft when fully extended.

4,539,956

DIESEL FUEL INJECTION PUMP WITH ADAPTIVE TORQUE BALANCE CONTROL

James F. Hengel; Donald J. Armstrong, both of Troy; Frank Ament, Rochester; Marc B. Center, Madison Heights, and John E. Ausen, Leonard, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 9, 1982, Ser. No. 448,311
Int. Cl.³ F02M *39/00, 59/20*
U.S. Cl. 123—357 **5 Claims**



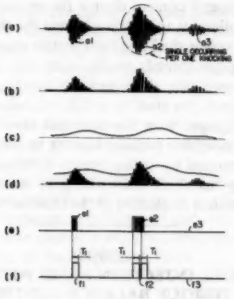
1. In an engine driven distributor type fuel injection pump

and diesel engine combination, with the pump including a housing means with an injection pump means and distributor means therein for sequentially supplying pressurized fuel via discharge passage means to a plurality of injection nozzles associated with the cylinders of the associate engine, a transfer pump for supplying fuel via inlet passage means to the injection pump means and, a governor controlled, mechanical metering valve operatively positioned in the inlet passage means for normally controlling fuel flow to the injection pump means, the improvement comprising: a solenoid actuated valve means operatively associated with said inlet passage means in a position between said transfer pump and said injection pump means; and, an adaptive torque balancing electronic controlled electric power source connected to said solenoid actuated valve means, whereby said solenoid actuated valve means is operative to supplement the metering valve control of fuel flow from said transfer pump to said injection pump means so that the fuel flow to the injection pump means and from the injection pump means to each of the respective injection nozzles for each of the cylinders is controlled as a function of engine operation and the incremental speed difference per preselected degrees of movement among the respective cylinders of the engine.

4,539,957
IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hiroshi Haraguchi, Oobu; Ko Narita, and Toshiharu Iwata, both of Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 3, 1982, Ser. No. 414,578
Claims priority, application Japan, Sep. 7, 1981, 56-139733
Int. Cl.³ F02P 5/04
U.S. Cl. 123—425 **5 Claims**



1. An ignition timing control system for internal combustion engines, comprising:

a knocking detector for detecting the presence of knocks of the engine to produce a knock signal and;

an electronic control unit for controlling the ignition timing from the knock signal produced by said knocking detector, including,

first discrimination means for discriminating at least two intensities of knocks from the knock signal of said knocking detector,

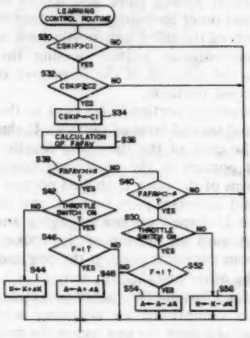
second discrimination means for discriminating the interval between a knock cycle and a succeeding knock cycle, which is decided as having knocks, and

means responsive to the outputs of said first and second discrimination means for providing a small amount of retard angle for ignition timing per one knocking when said interval is long and said intensity is light, and for providing a large amount of retard angle for ignition timing per one knocking when said interval is short and said intensity is heavy.

4,539,958
METHOD OF LEARN-CONTROLLING AIR-FUEL RATIO FOR INTERNAL COMBUSTION ENGINE

Toshimitsu Ito, and Nobuyuki Kobayashi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 3, 1984, Ser. No. 606,685
Claims priority, application Japan, May 9, 1983, 58-80628
Int. Cl.³ F02B 3/00
U.S. Cl. 123—440 **5 Claims**



1. A method of learn-controlling an air-fuel ratio for an internal combustion engine, comprising the steps of:

(a) obtaining a basic fuel injection time duration in accordance with an engine load and an engine speed;

(b) obtaining an air-fuel ratio feedback correction coefficient for allowing a fuel injection time duration to perform a proportional-plus-integral action in accordance with an output signal from an oxygen sensor for detecting a residual oxygen concentration in an exhaust gas;

(c) varying a correction value for allowing a mean value of said air-fuel ratio feedback correction coefficient to approach a predetermined value corresponding to a target air-fuel ratio, every time said air-fuel ratio feedback correction coefficient skips a plurality of times; and

(d) controlling the air-fuel ratio in accordance with said basic fuel injection time duration, said air-fuel ratio feedback correction coefficient and said correction value.

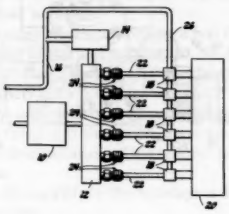
4,539,959
FUEL INJECTION SYSTEM WITH FUEL FLOW LIMITING VALVE ASSEMBLY

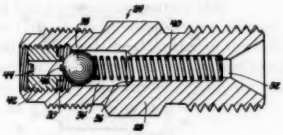
Donald L. Williams, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 27, 1984, Ser. No. 583,709
Int. Cl.³ F02M 37/04
U.S. Cl. 123—456 **3 Claims**

1. In a fuel injection system having an injector which delivers fuel to an engine during discrete injection events and wherein the time required for said injector to deliver fuel to the engine during an event has a desired upper limit: a valve assembly limiting fuel flow to said injector, said assembly comprising a valve body having a bore through which fuel flows to said injector, said bore including a portion defining a valve seat, a valve member reciprocable in said bore between said valve seat and a rest position upstream of said valve seat, said valve member being displaceable from said rest position toward said valve seat by the difference between the pressure in said bore upstream of said valve member and the pressure in said bore downstream of said valve member which occurs when fuel flows through said bore to said injector, such displacement continuing during the time fuel flows through said bore, the distance between said rest position and said valve seat equalling the extent of such displacement when the time fuel flows

through said bore exceeds said upper limit, whereby said valve member engages said valve seat to preclude fuel flow through said bore when the time fuel flows through said bore exceeds said upper limit, and return means effective for restoring said





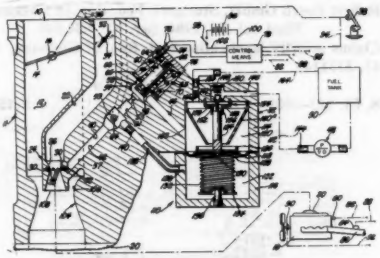
valve member to said rest position only when the pressure in said bore downstream of said valve member is substantially equal to the pressure in said bore upstream of said valve member.

4,539,960

FUEL PRESSURE REGULATOR

Warren H. Cowles, Bloomfield Hills, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

Filed May 14, 1982, Ser. No. 378,264
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—463 **7 Claims**



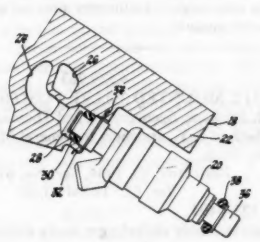
1. The combination of fuel metering apparatus for supplying metered rates of fuel flow to a combustion engine, fuel pressure regulating means and fuel pump means, wherein said fuel metering apparatus comprises body means, induction passage means formed through said body means for supplying motive fluid to said engine, said induction passage means comprising inlet means for permitting the inlet of air and first outlet means for discharging motive fluid to said engine, air throttle valve means for variably controlling the rate of flow of air through said induction passage means and into said engine, fuel metering means for metering liquid fuel in response to engine demands and indicia of engine operation, first fuel inlet means upstream of said fuel metering means for supplying unmetered fuel under superatmospheric pressure to said fuel metering means, metered fuel conduit means downstream of said fuel metering means for receiving metered fuel from said fuel metering means, said metered fuel conduit means communicating with said induction passage means through sonic discharge nozzle means, air passage means communicating between a source of air and said metered fuel conduit means, said air passage means being effective for commingling with said metered fuel in said metered fuel conduit means at a point upstream of said sonic discharge nozzle means, wherein said fuel pressure regulating means comprises first and second chamber means, pressure responsive movable wall means forming a common wall of and between said first and second chamber means, second fuel inlet means communicating with said first chamber means and said fuel pump means, fuel throttling valve means effective for throttling the flow of fuel from said fuel pump means to said first chamber means, said first chamber means being in fluid circuit with said first fuel inlet means, fluid pressure conduit means operatively interconnecting said second chamber means and said metered fuel conduit means, actuator means operatively connected to said pressure responsive movable wall means for operatively engaging said fuel throttling valve means as to be capable of causing said throttling valve means to move toward and away from a closed position, resilient means normally urging said actuator means in a direction whereby said actuator means would be effective for causing said fuel throttling valve means to move to a more fully opened position, second resilient means operatively connected to said fuel throttling valve means as to normally urge said fuel throttling valve means toward a closed position, return conduit means, said return conduit means communicating between said first chamber means and an area upstream of and in fluid circuit with said fuel pump means, and baffle means situated within said first chamber means as to serve to separate fuel vapors from the liquid fuel within said first chamber means and permit said fuel vapors to flow into said return conduit means.

4,539,961

FUEL RAIL

Terrance J. Atkins, Rochester; Martin J. Field, Churchville, and Donald J. Lamirande, Spencerport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1982, Ser. No. 410,612
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—468 **3 Claims**



1. A fuel rail for an engine, said rail comprising an elongated body having a plurality of axially spaced transversely extending fuel injector sockets, each of said sockets being adapted to receive a fuel injector suitable for delivering fuel from its socket to the engine, said body further having a pair of axially extending fuel passages, the lower portion of one of said passages intersecting said sockets for supplying fuel to said sockets, at least one end of said body having a circular recess intersected by and encompassing the associated ends of said fuel passages, and a circular plug received in and sealing said recess to provide a closure for the associated ends of said fuel passages, said one passage being characterized by vertical and horizontal dimensions, wherein the maximum vertical dimension of said one passage substantially exceeds the maximum horizontal dimension of said one passage whereby fuel vapor entrained in the fuel flowing through said one passage collects

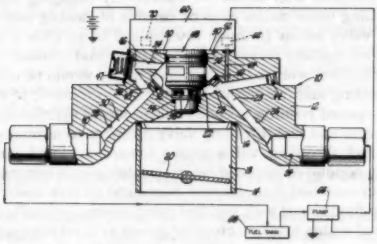
in the upper portion of said one passage and said lower portion of said one passage supplies only liquid fuel to said sockets, and wherein said one passage has an irregular configuration one side of which is outwardly convex and substantially conforms to the outline of said circular recess and the other side of which is outwardly concave and embraces said other passage to thereby provide a compact fuel rail.

4,539,962

FUEL INJECTION SYSTEM

Gary A. Nichols, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 19, 1984, Ser. No. 672,996
Int. Cl.³ F02M *51/02*
U.S. Cl. 123—470 **2 Claims**



1. In a fuel injection system having a fuel passage, a fuel pump energizable for circulating fuel through said passage, an injector operable for delivering fuel from said passage, and an electronic module adapted to operate said injector, and wherein a portion of said passage is formed in a body of heat conductive material and said module is mounted in maximum heat transfer relation to said body for conducting heat from said module to said body, the improvement comprising means for energizing said fuel pump in response to an increase in temperature in said module above a selected level to circulate fuel through said body whereby heat conducted from said module to said body is absorbed and directed away from said body and said module to thereby prevent excessive temperatures in said module.

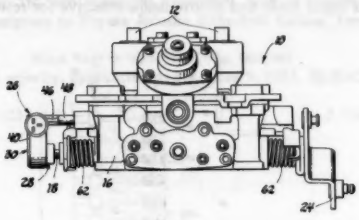
4,539,963

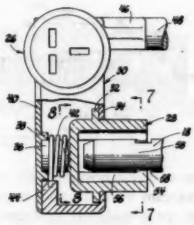
SHAFT MOUNTED VALVE POSITION SENSOR

Roger M. Brisbane, Spencerport, and Thomas R. Peffley, Rochester, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1984, Ser. No. 670,268
Int. Cl.³ F02M *63/00*
U.S. Cl. 123—494 **3 Claims**

1. In an assembly including a body defining a passage for fluid flow, a shaft rotatably supported in said body and having a portion extending into said passage, a valve secured on said portion of said shaft, said valve being rotatable with said shaft between open and closed positions to determine the area available for flow through said passage, and a valve position sensor having a housing, a rotor disposed in said housing, means for measuring the relative rotative position of said rotor in said housing, and a spring providing a bias for imparting relative rotation between said rotor and said housing, the improvement wherein said rotor is secured on said shaft, said housing is rotatably supported on said rotor and is engageable with said body, and said spring has a reaction through said rotor against said shaft biasing said housing toward engagement with said body, whereby rotation of said shaft in said body as the position of said valve is varied in said passage is accompanied by rotation of said rotor in said housing to thereby provide a measure of the position of said valve in said passage, and whereby said housing may rotate with said rotor away from engagement with said body as said valve is rotated toward said closed position in the event the bias of said spring does not impart relative rotation between said housing and said rotor,





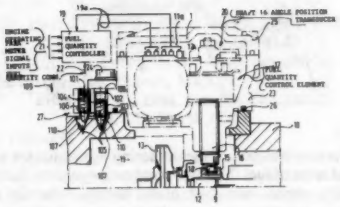
and wherein said spring further has a reaction through said housing against said body biasing said rotor and said shaft and said valve toward said closed position.

4,539,964

FUEL INJECTION PUMP STRUCTURE FOR AN INTERNAL COMBUSTION ENGINE

Ilja Djordjevic, Windsor, Conn.; Franz Eheim, and Helmut Laufer, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,546
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331149
Int. Cl.³ F02M *37/04*
U.S. Cl. 123—509 **15 Claims**



1. Fuel injection pump—injection quantity control element combination having

a pump housing **(10)** retaining an injection element **(12,15)**, and a control element housing **(23)** removably secured to the pump housing **(10)** and retaining a control element **(16, 17, 18)** interengageable with the injection element and controlling the quantity of fuel being injected,

wherein the relative positions of the pump housing **(10)** and of the control element housing **(23)** are determinative of the adjustment of the interengagement between the injection element **(12, 15)** and the control element **(16–18)**,

comprising, in accordance with the invention,

separable position locating means (27–34, 35') determining the relative position of the pump housing (10) and the control element housing (23) upon first assembling the housings with each other, and constraining reestablishment of said relative position after separation and reassembly of said housings,

said position locating means comprising a bolt (38, 48, 58, 68, 78, 88) having a projecting portion (40, 50, 60, 70, 80, 90, 100, 110) extending from one of the housings (10, 23) toward the other, and a fitting recess (37, 47, 57, 67, 77, 87, 97, 107), in the other one of the housings, and wherein the projection is fitted into the recess upon assembly of said housings and determination of the relative position of said housings; and

wherein (FIG. 3) one (23) of the housings is formed with a through-bore (46);

said bolt (48) is fitted in said through-bore with an interference fit and has a projecting portion (50);

the other one (10) of the housings being formed with an opening (44) larger than the diameter of the bolt;

and a hardening mass is provided within said opening (44) surrounding the bolt and forming with the bolt, upon hardening, an adjustment opening for the bolt.

4,539,965

FUEL FLOW MEASURING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE POWERED VEHICLE

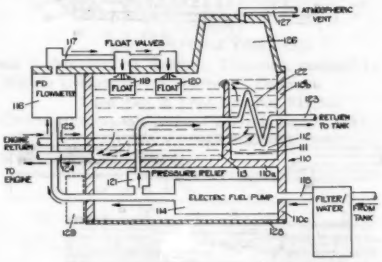
John P. Soltau, 5 Lightwoods Close, Copt Heath, Knowle, Solihull, West Midlands B93 9LS, England

Filed Apr. 5, 1984, Ser. No. 597,084

Claims priority, application United Kingdom, Apr. 8, 1983, 8309612

Int. Cl.³ F02M *37/00*

U.S. Cl. 123—514 **4 Claims**



1. A fuel flow measuring system comprising a housing in which there is mounted a constant flow electric fuel pump for drawing fuel from a main storage tank, a first tank zone in said housing to which excessive fuel delivered to the engine is returned in use, a second tank zone in said housing from which fuel is delivered to the engine, said second tank zone being vented to atmosphere, means sensitive to the depth of fuel in said second tank zone for admitting fuel from the outlet of the pump via a flow measuring device to said second tank zone so as to maintain the volume of fuel in said second tank zone constant, a pressure relief valve and a heat exchange device connected in series between the pump outlet and a return pipe for returning fuel to the main tank, and means for allowing fuel to pass from said first tank zone to said second zone of said housing.

4,539,966

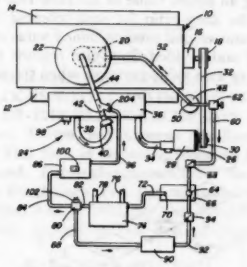
GAS SAVING APPARATUS

Mario R. Guell, Bogalusa, La., assignor to Tri-Saver Corporation, Thibodaux, La.

Filed Jun. 6, 1984, Ser. No. 618,365

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **8 Claims**



1. In combination with a combustion engine incorporating an air and fuel induction system including a carburetor defining air and fuel passage means extending therethrough including an inlet end for intaking ambient air, an outlet end for discharging an air and fuel mixture into intake passages of said engine and liquid fuel inlet means for admitting liquid fuel into an intermediate length venturi zone of said passage means in amounts proportional to increases and decreases in the venturi vacuum as a result of increases and decreases in the amount of air flowing through said zone, a supplemental air and fuel charge forming system including heated pressurized liquid fuel supply means, heated pressurized air supply means and heated fuel and air mixing means for receiving and mixing heated pressurized air and fuel and mixing the heated pressurized air and heated pressurized fuel to substantially fully vaporize the heated fuel in the heated pressurized air and form a pressurized and heated charge of vaporized fuel and air, said mixing means including pressurized air and fuel charge discharge means operative to discharge said heated charge into said passage means intermediate the inlet end thereof and said venturi zone in a downstream direction in said passage means closely upstream from said venturi zone with the discharging of the charge of pressurized air and vaporized fuel into said passage means being operative to, automatically, at least substantially reduce the usual vacuum associated with a carburetor venturi for drawing liquid carburetor fuel thereinto and to thereby at least substantially eliminate the usual introduction of liquid fuel from the carburetor into said venturi passage.

4,539,967

DUTY RATIO CONTROL METHOD FOR SOLENOID CONTROL VALVE MEANS

Toyohei Nakajima, and Kiyohisa Tomono, both of Shiki, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,102

Claims priority, application Japan, Jun. 30, 1983, 58-118721

Int. Cl.³ F02D *21/08, 33/00*

U.S. Cl. 123—585 **16 Claims**

1. A method of controlling a duty ratio with which solenoid control valve means arranged in a fluid passage is to be driven, to thereby control the flow rate of fluid flowing in said fluid passage to a desired value, the method comprising the steps of:

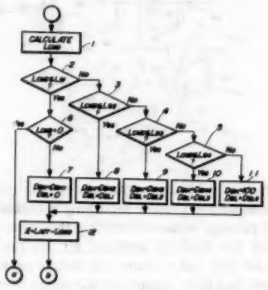
(1) dividing into a plurality of flow rate value regions a range of flow rate values between a first extreme flow rate value and a second extreme flow rate value which can be assumed by said fluid, respectively, when the duty ratio for said solenoid control valve means produced in each lot assumes a predetermined miminum value and a predetermined maximum value;

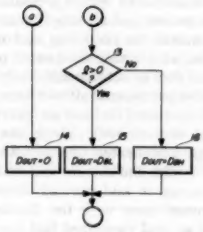
(2) setting beforehand a first predetermined value of duty

ratio corresponding to each of said divided flow rate regions of the step (1), and a second predetermined value of duty ratio corresponding to said each of said divided flow rate regions and larger than said first predetermined value of duty ratio, said first and second predetermined values of duty ratio being dependent upon the magnitude of variations of duty ratio-to-flow rate characteristic of said solenoid control valve means in each lot;

(3) detecting an actual value of the flow rate of said fluid;

(4) setting the duty ratio for said solenoid control valve means to said second predetermined value corresponding to one of said divided flow rate regions to which said desired flow rate value pertains, when the actual value of





the flow rate of said fluid detected in the step (3) is on the side of said first extreme flow rate value with respect to said desired flow rate value;

(5) driving said solenoid control valve means with the duty ratio set in the step (4);

(6) setting the duty ratio for said solenoid control valve means to said first predetermined value corresponding to one of said divided flow rate regions to which said desired flow rate value pertains, when the actual value of the flow rate of said fluid detected in the step (3) is on the side of said second extreme flow rate value with respect to said desired flow rate value; and

(7) driving said solenoid control valve means with the duty ratio set in the step (6).

4,539,968

BOWSTRING RELEASE DEVICE

Geary L. Garvison, 410 N. Shore Dr., South Haven, Mich. 49090

Filed Sep. 16, 1982, Ser. No. 418,791

Int. Cl.³ F41B *5/00*

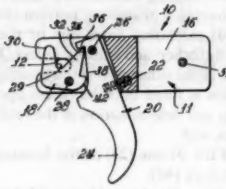
U.S. Cl. 124—35 A **14 Claims**

1. In a bowstring release device for engaging and releasing a bowstring, the improvement which comprises:

bowstring-engaging and releasing latch means adapted to engage and release a bowstring;

trigger means for actuating said latch means having a spring, a movable finger piece normally spring-biased by a spring to a forward position and adaped to be pulled back to said rearward position by a finger of the archer;

complementary detents on said trigger means and said latch means which are engaged in the rearward position of said finger piece to hold said latch means in bowstring-engag-



ing position and which become disengaged when said finger piece is released and allowed to be moved toward the forward position by said spring, thereby allowing said latch means to move to bowstring-releasing position; and,

casing means for holding said trigger means and said latch means in operative position.

4,539,969

CARTRIDGE ASSEMBLY INCLUDING PRESSURE CYLINDER SLIDABLY LOCATED IN CASING

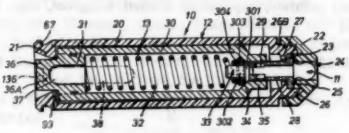
Michael E. Saxby, Warwickshire, England, assignor to Hilvenna Limited, Great Britain

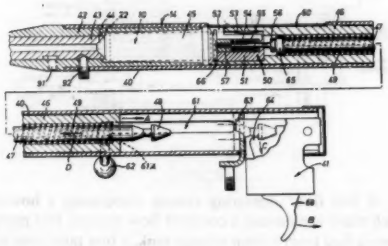
Filed Feb. 24, 1983, Ser. No. 469,365

Claims priority, application United Kingdom, Feb. 27, 1982, 8205875

Int. Cl.³ F41B *11/06*; **F42B** *9/02*

U.S. Cl. 124—57 **19 Claims**





15. A cartridge assembly comprising:

(a) a casing having a hollow nose,

(b) a pressure cylinder slidably located in the casing, and

(c) valve means normally biased by a valve spring in the cylinder to close a gas discharge path from the interior of the cylinder to the hollow,

(d) the valve means is openable by forcible movement of the cylinder toward the hollow nose,

(e) the pressure cylinder including a valve end portion having a valve seating,

(f) the valve means including a valve member having a

poppet form and being movable relative to the seating, and

(g) a sealing member is carried by the valve member,

(h) the valve member is attached to one end of the valve spring,

(i) the valve seating is tapered and the valve member has a tapered valve face which engages the valve seating to substantially close the valve discharge path from the gas storage space when the valve means is closed, and

(j) the sealing member overlies one end of the junction between the valve seating and valve face to seal said junction.

4,539,970

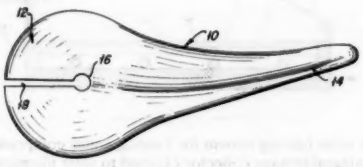
BOWSTRING-HELD ARCHERY DEVICE

Peter R. Griz, 2655 Baldwin, Oxford, Mich. 48051

Filed Jul. 26, 1983, Ser. No. 517,332

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—90 **4 Claims**



1. A bowstring-held archery device which serves as an anchor point for an archer's pulling hand, said device being elongated and having a body and a tail projecting from said body, said body having means for independently and totally supporting the device on a bowstring in fixed relationship thereto, the tail having sufficient length to project into the corner of the archer's mouth, whereby said bowstring-held archery device enables the archer to consistently duplicate said anchor point, and said device allowing the archer to see the bowstring during aiming without interfering with sighting of a target.

4,539,971

GRINDSTONE DRESSER

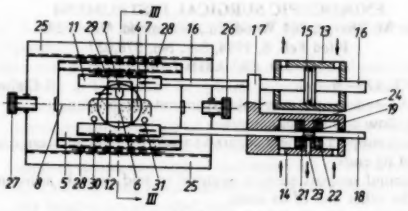
Knud A. Moeller, Ny Solbjerg, Denmark, assignor to A.M.C. Maskin Compagni A/S, Aarhus C, Denmark

Filed Aug. 2, 1983, Ser. No. 519,544

Claims priority, application Denmark, Sep. 6, 1982, 3970/82

Int. Cl.³ B24B *53/08*

U.S. Cl. 125—11 H **3 Claims**



1. A device for dressing of a grindstone mounted on a cylindrical grinding machine, said device comprising:

a carriage mounted for linear movement and a pair of connecting rods over which the carriage moves, said carriage including, a holder rotatably mounted within said carriage and a dressing tip in said holder, said carriage including a pair of separate toothed racks connected to said rods and a gear wheel engaged therebetween and with said rotatably mounted holder to cause rotation of said holder in response to movement of said toothed racks whereby equal movement of said racks will cause linear movement of said holder and unequal movement will cause a turning movement of the carriage,

said toothed racks being connected to reciprocating hydraulic motors, means to operate said hydraulic motors to select linear or turning movement of the carriage as needed.

4,539,972

METHOD FOR THE MULTIPLE LAP-CUTTING OF CRYSTAL BLOCKS WITH CONTINUOUS SHORTENING OF THE BLADE EXCURSION

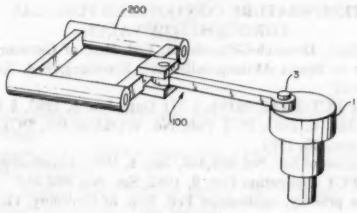
Wolfgang Ermer, Hirten, and Klemens Mühlbauer, Burgkirchen, both of Fed. Rep. of Germany, assignors to Heliotronic Forschungs-und Entwicklungsgesellshaft fur Solarzellen-Grundstoffe, Burghausen, Fed. Rep. of Germany

Filed Aug. 4, 1983, Ser. No. 520,338

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247826

Int. Cl.³ B28D *1/06*

U.S. Cl. 125—16 R **6 Claims**



1. A method for the multiple lap-cutting of monocrystalline and polycrystalline rods or blocks, comprising the steps of:

providing a connecting rod system for connecting a cylindrical crank pin having a longitudinal axis, of a rotating drive crankhead to a clamping frame having a blade pack held in the frame, so that rotation of the crank pin about a central axis of the crankhead parallel to the longitudinal axis of the crank pin causes lateral reciprocating movement of the clamping frame and blade pack in a suspension of a lapping agent through a workpiece to be cut, the length of each cutting stroke of the blade pack related to the distance between the longitudinal axis of the crank pin and the central axis of the crankhead;

rotating the crankhead about the central axis thereof to cause the crank pin to circumscribe said central axis so that the blade pack undergoes said lateral reciprocating movement; and

continuously decreasing the distance between the longitudinal axis of the crank pin and the central axis of the crankhead, so as to continuously shorten the cutting stroke of the blade pack during the cutting operation.

4,539,973

PORTABLE OUTDOOR COOKING UNIT WITH DEVICE FOR EXTINGUISHING THE FLAME OF CANNED JELLY ALCOHOL AND THE LIKE

Paul W. Hait, Los Gatos, Calif., assignor to Pyromid, Inc., Los Gatos, Calif.

Filed Nov. 5, 1984, Ser. No. 668,311

Int. Cl.³ F24C *5/00*

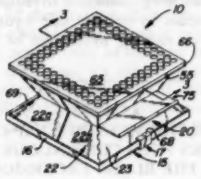
U.S. Cl. 126—43 **12 Claims**

1. A cooking unit comprising:

(a) a support, said support being adapted to support a container of flammable fuel;

(b) a support member of truncated pyramidal configuration disposed on said support, said support member having an open upper end;

(c) a firebox of an inverted, truncated pyramidal configuration



disposed on said support member, said firebox having an open lower end, the lower end of said firebox being received by the upper open end of said support member; and

(d) means on said firebox disposable over the container of flammable fuel for extinguishing the flame thereof.

4,539,974

TEMPERATURE CONTROLLED FUEL GAS THROUGHFLOW VALVE

Curt Tittert, Dreieich-Götzenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

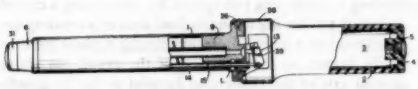
PCT No. PCT/DE82/00194, § 371 Date Jun. 6, 1983, § 102(e) Date Jun. 6, 1983, PCT Pub. No. WO83/01369, PCT Pub. Date Apr. 28, 1983

Continuation of Ser. No. 509,466, Jun. 6, 1983, abandoned. This PCT application Oct. 9, 1982, Ser. No. 694,485

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1981, 3140799; Jan. 28, 1982, 3202720

Int. Cl.[3] **A45D** *1/04*

U.S. Cl. 126—409 **10 Claims**



1. In a gas powered heating device having a fuel supply chamber and a combustion chamber, an improved thermostatic gas flow control valve, comprising:

a regulator frame disposed between said fuel supply chamber and said combustion chamber and being integrally constructed of a high quality material which will not alter its shape under the influences of temperature and mechanical forces encountered during the operation of the gas powered heating device;

a fuel supply channel provided in said regulator frame;

a movable valve member disposed within said channel for controlling the flow of fuel through said channel dependent upon the positioning of said valve member;

a control member (**16**) pivotally mounted on said regulator frame, said control member being in contact with said valve member to thereby determine the position of said valve member; and

temperature response means directly attached to said regulator frame and engaging said control member for pivotally positioning said control in response to the temperature within said combustion chamber;

whereby the position of said thermostatic control valve is only influenced by the positioning of said control member and the temperature of said temperature response means and is substantially independent of temperature related dimensional changes in other components of said heating device.

4,539,975

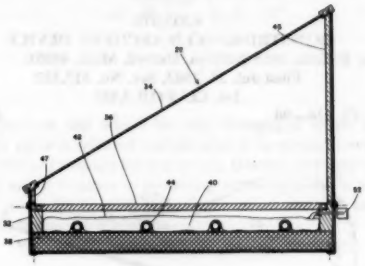
INTEGRAL STORAGE SOLAR HEATING SYSTEM

William P. Teagan, Acton, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 356,882, Mar. 10, 1982, abandoned. This application Oct. 28, 1983, Ser. No. 546,262

Int. Cl.[3] **F24J** *3/02*

U.S. Cl. 126—439 **19 Claims**



1. In a solar heating system for heating water comprising

a. an integral storage collector exposed to solar illumination said collector including absorber means, a heat storage medium of large heat capacity and high thermal conductivity directly heated by said absorber means and a water flow path in heat exchange relationship with said heat storage medium; said water flow path having connected thereto a water inlet and a water outlet; and

b. a primary pressurized water supply line connected to said water inlet, whereby line pressure from said primary pressurized water supply line into said water inlet forces fresh water through said water flow path of the collector, as heated water is removed through said water outlet; the improvement comprising a collector cover essentially transparent to solar illumination, said collector cover forming an angle of about 5° to about 40° with respect to said integral storage collector; said collector cover and said integral storage collector connected by at least one solar radiation reflecting means, wherein said reflector is positioned at an outer edge and substantially perpendicular to said absorber and said integral storage collector positioned substantially parallel to the horizon.

4,539,976

ENDOSCOPIC SURGICAL INSTRUMENT

Jewett M. Sharpe, 201 Wood Rd., Richmond, Va. 23229

Filed Feb. 8, 1984, Ser. No. 578,037

Int. Cl.[3] **A61B** *1/00*

U.S. Cl. 128—6 **7 Claims**

1. An endoscopic surgical instrument comprising:

a hollow cylindrical cannula;

a first support element secured to said cannula adjacent one of its ends;

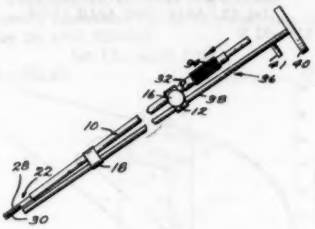
a second support element secured to said cannula adjacent the other end of its ends;

an elongated optical device retained in substantially parallel relationship with the cannula by said support elements;

a scalpel member operatively related to said cannula, said scalpel member comprising a cylindrical element slidably received within the cannula, said cylindrical element having a substantially U-shaped slot at one end extending longitudinally thereof, one side of said slot being ground to produce a cutting edge; and

said scalpel member further comprising: a shoulder located adjacent the opposite end of said cylindrical element, the

distance between the shoulder and said cutting edge being greater than the length of the cannula whereby when said shoulder engages an end of the cannula, the cutting edge



is exposed; and gripping means located on the opposite side of the shoulder from the slotted end of the cylindrical element.

4,539,977

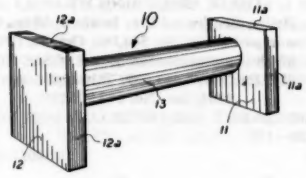
THERAPEUTIC SUPPORT MEANS

Paul E. Schneider, Sr., 300 N. Main St., Woodsfield, Ohio 43793

Continuation of Ser. No. 212,397, Dec. 3, 1980, abandoned. This application Feb. 23, 1983, Ser. No. 468,972

Int. Cl.³ A61F *5/00*

U.S. Cl. 128—68 **1 Claim**



1. A means for therapeutic relief of the lower back pain comprising:

(a) a pair of spaced apart end means, each of said end means having at least three peripheral substantially planar surfaces, each of said surfaces oriented in the same plane as a corresponding surface of the opposite end means to provide a plurality of stable base surfaces for said therapeutic support means, and each of said means is a square whereby four substantially horizontal foot-support surfaces of varying heights are provided; and

(b) a support member having a cross-sectional area substantially less than said end means and joining said end means together, said support member secured horizontally between said end means but offset relative to the centerpoint thereof in a manner whereby a plurality of substantially horizontal foot-support surfaces of varying heights are provided, each in response to rotary selection of one of said plurality of stable base surfaces, and further wherein said support member is a cylindrical tube.

4,539,978

APPARATUS FOR TREATING BACK AILMENTS

Leif Lundblad, Häradsvägen 102, S-141 41 Huddinge, Sweden

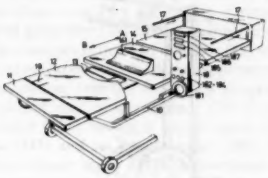
PCT No. PCT/SE82/00263, § 371 Date Feb. 9, 1983, § 102(e) Date Feb. 9, 1983, PCT Pub. No. WO83/00620, PCT Pub. Date Mar. 3, 1983

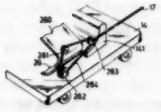
PCT Filed Aug. 19, 1982, Ser. No. 474,648

Claims priority, application Sweden, Aug. 21, 1981, 8104962

Int. Cl.³ A61F *5/00*

U.S. Cl. 128—71 **5 Claims**





1. An apparatus for treatment of back ailments of a patient, comprising:

a support means (**10**) for supporting a patient in a horizontal, lying position;

a first tension force take-up means (**26**), arranged to pass around the pelvis of the patient;

a second tension force take-up means (**19**), arranged to pass around the chest of the patient;

pulling or tension means (**17**) connected to one of the two tension force take-up means (**26**) and arranged to move the same relative to the support means (**10**);

a readily moveable carriage means (**14**) for movement relative to the support means (**10**), with but slight friction, for carrying either the pelvis or chest of the patient and exhibiting a high degree of friction against the associated tension force take-up means (**26**);

and a moveable means (**13**) for supporting the small of the patient's back, and wherein the readily moveable carriage means (**14**) comprises means for executing, independently of translatory movement of said carriage means (**14**) relative to the support means (**10**), rotary movement substantially in the horizontal plane and a skewing movement about an axis extending substantially parallel to the longitudinal direction of the carriage means (**14**), in accordance with a predetermined program.

4,539,979

TEMPORARY CERVICAL TRACTION MAINTENANCE

Paul W. Bremer, Jacksonville, Fla., assignor to Bremer Orthopedics, Inc., Jacksonville, Fla.

Filed Apr. 27, 1983, Ser. No. 489,076

Int. Cl.³ A61H *1/02*

U.S. Cl. 128—75 **20 Claims**

19. A portable cervical traction device comprising:

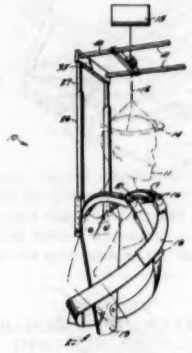
a pair of shoulder support structures;

a plate of radiolucent material operatively attached to said shoulder support structures and adapted to engage a patient's back;

strap means operatively attached to said plate for strapping said plate onto a patient's body with said shoulder support structures in contact with the patient's shoulders;

a traction support member operatively attached to said plate

and extending upwardly therefrom, said traction support member comprising: a lower cross bar; an upper cross bar; means for attaching said lower cross bar to said plate; and two sets of telescoping components operatively attached to said upper and lower cross bars, with biasing means associated with said telescoping components of each set for providing a biasing force tending to separate said



lower and upper cross bars, but allowing said lower and upper cross bars to be moved toward each other against said biasing force, with said biasing force gradually increasing as said upper and lower cross bars are moved toward each other; and

traction cable grasping means operatively attached to said upper cross bar.

4,539,980

MALE ORGAN CONDITIONER

John L. Chaney, 156 Broad St., Box 592, Lake Geneva, Wis. 53147

Filed Sep. 9, 1983, Ser. No. 530,523
Int. Cl.[3] A61F *5/00*
U.S. Cl. 128—79 **8 Claims**

1. A device for developing and maintaining an erect penis, comprising:

a ring composed of elastic material having a circular outer periphery and defining a uniformly round inside opening when said ring is unstretched,

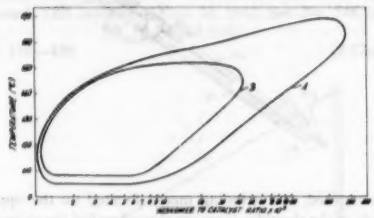
a pair of loops composed of said elastic material, said loops being joined integrally with said outer periphery of the ring generally diametrically opposite of each other for being engaged to impart a stretching force to said ring generally radially outwardly to enlarge said inside opening sufficiently for said ring to be slipped over the penis to the root thereof such that when said stretching force is relieved residual elastic force in said ring is sufficient to allow blood to be manually massaged into the penis and to prevent outflow of blood from the penis.

4,539,981

ABSORBABLE BONE FIXATION DEVICE

Deger C. Tunc, East Brunswick, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Nov. 8, 1982, Ser. No. 439,962
Int. Cl.[3] A61F *5/04;* **A61B** *17/04*
U.S. Cl. 128—92 B **7 Claims**



1. A process of forming a high molecular weight polyactide polymer capable of being used as a resorbable bone fixation device comprising:

polymerizing L(−)lactide monomer in an inert atmosphere in the presence of a stannous octoate catalyst,

said catalyst being present in a monomer to catalyst mole ratio of from 1000 to 300,000,

the polymerization being conducted at a temperature of from 105° C.,

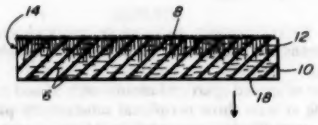
the temperature and monomer to catalyst mole ratio being selected to fall within the curve A of FIG. **1** to form a polymer having an unreacted monomer content of less than 2% and an inherent viscosity as a 1 percent solution in chloroform at 25° C. of between 4.5 and 10.

4,539,982

ODOR ABSORBING WRAP

Richard L. Bailly, Beechwood Clr., Boxford, Mass. 01921

Continuation-in-part of Ser. No. 544,500, Oct. 24, 1983, Pat. No. 4,469,740, which is a continuation-in-part of Ser. No. 470,606, Feb. 28, 1983, Pat. No. 4,461,099. This application Aug. 24, 1984, Ser. No. 643,775
Int. Cl.[3] A61L *15/00;* **B32B** *3/12, 7/02, 7/04*
U.S. Cl. 128—156 **13 Claims**



1. An odor-absorbing web for use in wrapping a portion of the body, said web comprising:

a thin, flexible sheet comprising a matrix binding together a multiplicity of activated charcoal odor-absorbing particles; and

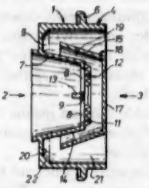
a hydrophobic material comprising a multiplicity of hydrophobic fibers, a substantial fraction of which penetrates said matrix, affixed to a first surface of said sheet for placement in contact with a body surface.

13. A process for reducing odor beneath a device used in close proximity to the surface of the human body, said process comprising the step of applying to said body surface the web of claim **1** with said first surface facing toward said body surface prior to application of said device.

4,539,983
RESPIRATOR SPEECH TRANSMITTER

Cyril E. N. Angell, Trowbridge, England, assignor to Avon Industrial Polymers Limited, Wiltshire, England

Filed Aug. 15, 1983, Ser. No. 523,066
Claims priority, application United Kingdom, Aug. 18, 1982, 8223825; May 20, 1983, 8314065
Int. Cl.³ A62B 7/00
U.S. Cl. 128—201.19 10 Claims

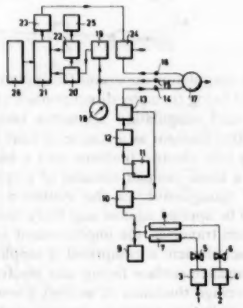


1. A speech transmitter for a respirator comprising:
a hollow tube having a first open end for facing outwardly of the respirator and a second open end for facing inwardly of the respirator nearer to the mouth of a user;
a baffle spaced from and extending over said first open end of said hollow tube, said baffle having an inner skirt extending around at least a part of said tube;
an outer skirt extending from said tube around said inner skirt; the outer surface of said hollow tube, said inner skirt, and said outer skirt defining an annular convoluted passageway extending from said first open end of said tube, said annular passageway increasing in annular width as it extends from said first open end of said tube; and
uni-directional valve means located in said transmitter for permitting air flow through the tube in the direction from the second end to the first end and then into said convoluted passageway.

4,539,984
RESPIRATOR DEVICE PARTICULARLY FOR USE IN PERINATAL MEDICINE

János Kiszel; László Papp, and László Nagy, all of Budapest, Hungary, assignors to Vas es Moszeripari Szovetkezet, Hungary

PCT No. PCT/HU81/00012, § 371 Date Nov. 19, 1982, § 102(e) Date Nov. 19, 1982, PCT Pub. No. WO82/03326, PCT Pub. Date Oct. 14, 1982
PCT Filed Mar. 26, 1981, Ser. No. 444,598
Int. Cl.³ A61M 16/00
U.S. Cl. 128—204.23 5 Claims



1. A respirator device, particularly for the respiratory treatment of new-born and inmate infants, comprising an oxygen (1) and an air (2) duct coupled respectively to a source of oxygen and pressurized air, a mixing conduit for receiving said oxygen and air, valve means (5, 6) for adjusting the oxygen-air ratio of said mixture, a conduit coupled to said valve means conducting said mixture, a patient junction (17) coupled to said conduit, a controlled beat generator (21) for determining the rhythm of breathing and having an output, a pressure adjusting valve means (24) controlled by the output of the beat generator (21) and coupled to the patient junction for providing adjustable positive pressure threshold levels both during the inspiration and expiration periods, a respiration demand detector (19) comprising an input and an output, said input of said demand detector is coupled to the patient junction (17) for detecting the pressure drop caused by the patient during inspiration, a starting signal generator (20) having an input connected to the output of the respiration demand detector (19) for generating a starting signal in response to the detected pressure drop of each detected inspiration, said starting signal generator (20) comprising an output, said beat generator (21) comprises a sawtooth generator (211) having a trigger input (214), a retriggered input (215) and an astable input (216) and an output wherein said trigger input (214) is associated with assisted respiration; said retriggered input (215) is associated with controlled assisted respiration, and said astable input (216) is associated with controlled respiration in absence of spontaneous breathing, a gating circuit (213) comprising three outputs each being coupled to a respective one of said inputs (214, 215, 216) of said sawtooth generator, said gating circuit (213) comprising an input connected to the output of the starting signal generator (20), a respiration stoppage detector comprising an input and output, said output of the starting generator (20) is connected also to said respiration stoppage detector (22) for sensing the presence of spontaneous breathing and for providing a signal in the absence of an output pulse from the starting signal generator (20) within a predetermined period of time, the gating circuit (213) comprises a plurality of enabling inputs, a mode controller (26) for the selection of the operational mode corresponding to the required treatment and having a plurality of outputs connected to respective outputs of said mode controller (26) and accordingly selecting an appropriate one of the trigger, retrigger or astable inputs (214, 215, 216) of the sawtooth generator (211) in accordance with the setting of said mode controller (26) set by the operator, a comparator (212), said pressure adjusting valve means (24) comprising a control input, said output of the sawtooth generator (211) is connected via said comparator (212) to said control input of said pressure adjusting valve means (24), wherein said demand detector (19) is formed by a membrane-operated pressure difference-to-capacitance transducer comprising a housing (30) divided by a metal membrane (31) into two chambers, a pressure adjusting assembly (34) is coupled to one of said chambers, the other chamber communicating with an interior of the patient junction (17), and wherein said pressure adjusting valve means (24) comprises a controlled expiration valve (242) having a control input coupled to the output of the beat generator (21) and a pneumatic input coupled to the patient junction (17) which in rest condition defining the expiration pressure, and an inspiration valve (241) having an input coupled to the patient junction (17) and in the on condition of the expiration valve (242) defining the inspiration pressure.

4,539,985
ASPIRATOR AND RESUSCITATOR FOR NEWBORN ANIMALS

Joseph M. Magrath, P.O. Box 148, McCook, Nebr. 69001

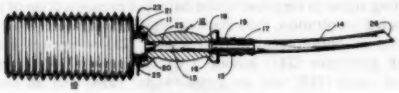
Filed Jun. 3, 1983, Ser. No. 500,770
Int. Cl.³ A61M 16/00
U.S. Cl. 128—205.13 7 Claims

1. A readily portable device for effecting the aspiration and resuscitation of newborn animals which comprises:
a generally cylindrical bellows of the pleated type including means for biasing it to its expanded configuration and being longitudinally compressible to discharge air therefrom,
said bellows having a pleated cylindrical side wall and a

non-perforated end wall at one end and an opposite end wall having a central opening at its other end,

an elongated rigid tubular fitting having an open longitudinally extending passage therethrough from end to end and with one end connected to said bellows about said opening in open communication with the interior of said bellows and affording the passage of air to and from said bellows,

a detachable adaptor having an open passage extending therethrough from end to end with one end connected to the other end of said fitting in communication with said passage in said fitting and animal connection means connected to the other end of said adaptor in communication



with the passage in said adaptor having a configuration for engagement with an animal for providing open communication between said bellows and a respiratory passage of the animal, said open passages in said fitting and adaptor defining a bidirectional, substantially unobstructed flow path between said bellows and said animal connection means,

the external configuration of said fitting providing a whole hand grip for holding the device with said adaptor attached thereto and with said animal connection means in communication with a respiratory passage of an animal while manipulating said bellows with the other hand to deliver air to or withdraw fluid from the passage.

4,539,986

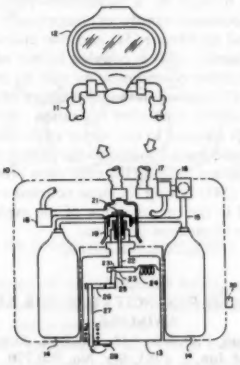
SIMULATED OXYGEN BREATHING APPARATUS

Edmund Swiatosz, Maitland; Paul D. Grimmer, Winter Park, and Rocco M. Sciascia, Altamonte Springs, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 13, 1982, Ser. No. 417,815

Int. Cl.³ A62B *7/02*

U.S. Cl. 128—205.13 **3 Claims**



1. A modified personal breathing apparatus for training use having a breathing bag, a face mask, flexible tubing connecting said face mask and breathing bag such that air is exhaled into said breathing bag, and a canister designed for cooperative insertion into said apparatus in fixed relation thereto, wherein the improvement comprises:

means within said breathing bag for storing high pressure air including two cylinders containing said high pressure air, each cylinder having an outlet;

means for reducing said pressure of said air to a breathable level including a plurality of regulators connected in series, each having an input and an output, and that together have an inlet and an outlet, with the input of the first regulator in said seves defining said inlet, the output of the first regulator connected to the input of the second regulator, and the output of the second regulator in said series defining said outlet of said plurality of regulators, and a tubular conduit means connected to the outlet of each said cylinder and downstream therefrom to the inlet of said plurality of regulators for providing a single air passage to said plurality of regulators that is common to both said cylinders;

selectively removable closure means operably connected at the outlet of said plurality of regulators for obstructing the flow of air therefrom;

flexible tubing connected at one end thereof to said closure means and at the opposite end thereof to said face mask, operably providing a passageway for air from said closure means to said face mask; and

actuating means within said canister removably connected to said closure means for selectively removing the closure means from between the flexible tubing and the reducing means, permitting the flow of air between said reducing means and said flexible tubing.

4,539,987

APPARATUS FOR COAGULATION BY HEAT RADIATION

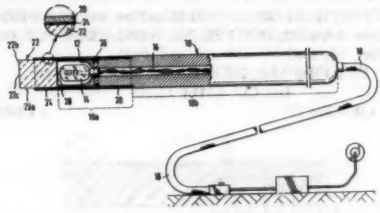
Günther Nath, Dr. Max-Strasse 76, Grünwld, Fed. Rep. of Germany (D-8022); Albert Kreitmair, Deisenhofenerstr.79d, and Vincent Jaeger, Buchnerstrasse 9, both of München, Fed. Rep. of Germany (D-8000)

Continuation of Ser. No. 237,669, Feb. 24, 1981, abandoned. This application Jun. 4, 1984, Ser. No. 617,140

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1980, 3007388

Int. Cl.³ A61B *17/38*

U.S. Cl. 128—303.1 **26 Claims**



1. In a radiation coagulation apparatus for applying radiation to a limited area of living tissue by direct contact of said apparatus therewith, said coagulation apparatus comprising an incandescent electric filament as a source of heat radiation, a housing enclosing said electric filament, and a radiation exit system including a tissue contact element of a crystalline dielectric material transmissive to the radiation forming a contact surface to be applied against said body tissue through which said radiation traverses, the improvement wherein

said tissue contact element is comprised of sapphire, and has a radiation entrance surface facing said electric filament, and has an average thickness of at least 4 mm measured between the radiation entrance surface and the tissue contact surface in the direction of the radiation; and

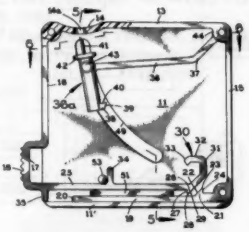
the radiation output density of said radiation source at the tissue contact surface of said contact element is at most 150 watts/cm^2.

4,539,988

DISPOSABLE AUTOMATIC LANCET

Gaylord R. Shirley, Delray Beach, and Daniel J. Chiodo, Miami, both of Fla., assignors to Packaging Corporation International, Hialeah, Fla.

Filed Jul. 5, 1983, Ser. No. 510,652
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—314 **18 Claims**



1. An automatic surgical lancet comprising:

means defining a housing having a top wall with an upwardly-facing concave depression for receiving the tip of a patient's finger, said top wall having an opening at said depression for passing a lancet blade;

a spring arm inside said housing having a free end which is movable toward and away from said opening;

a release actuator for holding said spring arm cocked in a stressed position in which its free end is held away from said opening, said release actuator being located below said top wall of the housing and being manually operable to release said spring arm for movement of its free end up toward said opening;

a lancet blade holder on said free end of said spring arm;

and a lancet blade carried by said holder;

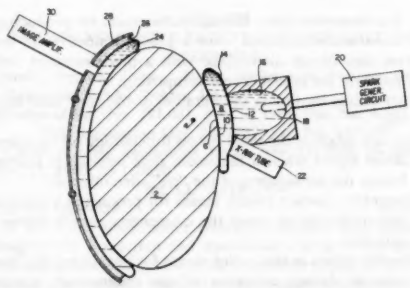
said release actuator being movable substantially horizontally to release the spring arm.

4,539,989

INJURY-FREE COUPLING AND DECOUPLING OF THERAPEUTIC SHOCK WAVES

Bernd Forssmann, Friedrichshafen; Wolfgang Hepp, Immenstaad; Güenter Hoff, Daisendorf, and Christian Chaussy, Germering, all of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,568
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146626
Int. Cl.³ A61B *17/22*
U.S. Cl. 128—328 **6 Claims**



1. In an instrument system for destroying concretions in a body of living tissue, having a liquid filled focusing chamber including a focusing surface which is a part of an ellipsoid of rotation, there being a shock wave generator in the focusing chamber at one focus thereof for generating shock waves by means of arc discharges, a first pad filled with degassed water and provided for being located between the liquid-filled focusing chamber and a coupling site of the body,

the improvement of the system comprising, the front and rear sides of said first pad being composed of shape-adapting, acoustically matched thin foils, the first pad, because of its flexibility, its thinness and the use of transmitting materials, permitting simultaneous introduction of X-rays of ultrasonic waves for locating the concretions and to monitor the success in comminution;

a second liquid filled pad similar to the first pad and provided for being located at a body site for acoustically decoupling from the body shock waves having been transmitted through the body, said second pad having a surface area for enclosing a large area of the body and having a rear side;

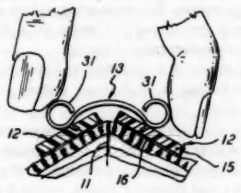
a rigid dish; and a damping or diffusely reflecting layer fastening the rear side of said second pad to said dish.

4,539,990

SUTURELESS CLOSURE SYSTEM

Oscar G. Stivala, 10 Whited St., Little Falls, N.Y. 13365

Filed Sep. 16, 1983, Ser. No. 532,702
Int. Cl.³ A61B *17/08*
U.S. Cl. 128—335 **6 Claims**



1. A sutureless closure for drawing together the side margins of a wound and holding the margins closed in an everted condition that includes:

a pair of opposed anchor plates being located so that one of the plates is positioned on each side of the wound,

each plate including a thick penetratable fabric having an adhesive layer affixed to the bottom surface thereof whereby the plate is securely attached to the skin adjacent the wound,

an arcuate shaped bridge formed of a deformable metal, said bridge spanning the wound and overlying the two anchor plates so that the radius of curvature of the bridge is centered within the plane of the wound,

a pin downwardly disposed from each end of the bridge, each pin penetrating the fabric of the underlying plate through the top surface of the plate, the length of the pins being less than the depth of the fabric whereby the pins cannot penetrate the skin,

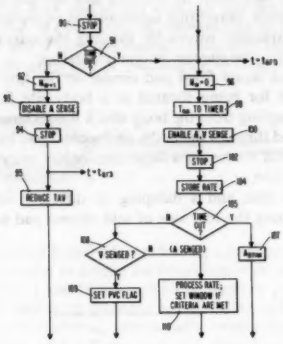
said pins slanting inwardly toward the center of the radius of curvature of the bridge whereby deforming the bridge inwardly to shorten the chordal length between the pins turns the plates upwardly and inwardly to evert the skin at wound opening.

4,539,991

DUAL CHAMBER PACEMAKER

Wim Boute, Doesburg; Frederik H. M. Wittkampf, Brummen, and Gerrit W. van Arragon, Dieren, all of Netherlands, assignors to Vitafin N.V., Curacao, Netherlands Antilles

Filed Feb. 11, 1983, Ser. No. 465,890
Int. Cl.³ A61N *1/30*
U.S. Cl. 128—419 PG **24 Claims**



1. A cardiac pacemaker having atrial terminal means for connection thereto of P signals representing atrial heartbeats and ventricular terminal means for connection thereto of generated ventricular stimulus Vst pulses, ventricular pulse generating means for generating and connecting said Vst pulses to said ventricular terminal means, atrial sensing means for sensing P signals connected to said atrial terminal means from the patient's heart,

measuring means for measuring when a sensed P signal follows a connected Vst pulse by a V-A time which is within a predetermined range,

counting means for counting the number of successive P signals having a V-A time within said predetermined range, and

skipping means for causing skipping of sensing of the next P signal within said predetermined range following sensing of a P signal which is counted as the nth successive P signal by said counting means, where n is a predetermined number.

4,539,992

METHOD AND APPARATUS FOR COMMUNICATING WITH IMPLANTED BODY FUNCTION STIMULATOR

Richard V. Calfee, Houston; Robert N. Bertasz, Alvin; Reese S. Terry, Jr., Freeport; Pat L. Gordon, West Columbia, and Ross G. Baker, Jr., Houston, all of Tex., assignors to Intermedics, Inc., Angleton, Tex.

Continuation of Ser. No. 972,231, Dec. 22, 1978, abandoned. This application Apr. 25, 1983, Ser. No. 486,157
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **43 Claims**

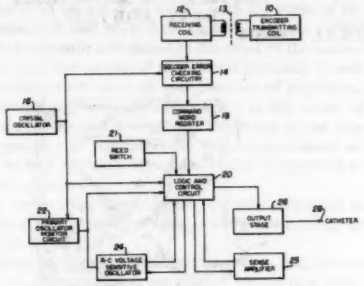
1. In a method for varying the operating parameters of a body implantable device by non-invasively coupling an externally generated control signal to electronic circuitry within said implantable device and deriving a binary control word for varying said parameters, an improved method for preventing inadvertent variation of said operating parameters, comprising the steps of:

deriving a first binary word functionally equivalent to a first externally generated control signal,

deriving a second binary word functionally equivalent to a second externally generated control signal,

said first and second externally generated control signals each functionally related to a same set of selected operating parameters,

serially comparing said first and second binary words to verify equivalence, and



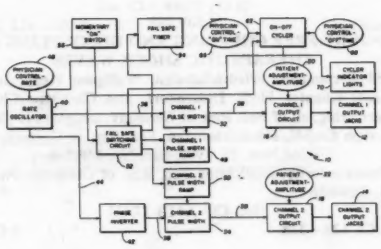
thereafter transferring said verified binary control word to a command register for altering said operating parameters.

4,539,993

FAIL-SAFE MUSCLE STIMULATOR DEVICE

David J. Stanton, Anoka, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 18, 1982, Ser. No. 442,532
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—421 **2 Claims**



1. In a tissue stimulator having cycler means for producing a periodic stimulation signal with a predetermined "on" time interval repetitively alternating with a predetermined "off" time interval, the improvement comprising:

timer means for timing the duration of the "on" time interval;

time out means in the timer means for shutting off the stimulation signal when a maximum time interval is reached before the termination of the "on" time interval;

momentary contact switch means for producing a constant stimulation signal when the momentary switch means is actuated;

override means in the cycler means for generating the "on" interval during actuation of the momentary contact switch means; and

wherein the time out means turns off the timer means if the "on" interval initiated by the momentary contact switch means exceeds the predetermined maximum interval.

4,539,994

METHOD FOR TRANSCUTANEOUS MEASUREMENT OF A BLOOD PARAMETER AND AN ELECTROCHEMICAL MEASURING ELECTRODE DEVICE FOR CARRYING OUT THE METHOD

Per L. Baumbach, Copenhagen, and Jorgen Poulsen, Århus, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

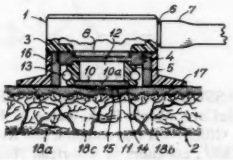
PCT No. PCT/DK82/00093, § 371 Date Jun. 6, 1983, § 102(e) Date Jun. 6, 1983, PCT Pub. No. WO83/01510, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 12, 1982, Ser. No. 509,441

Claims priority, application Denmark, Oct. 13, 1981, 4546/81

Int. Cl.³ A61B 5/00

U.S. Cl. 128—635 28 Claims



1. An electrochemical measuring electrode device for transcutaneous measurement of a blood parameter, said device comprising:

a body formed of a heat conductive material, said body including a surface part for application to a skin surface in heat conductive relationship therewith, sensor means for operatively responding to said blood parameter, and first thermostating means for thermostating said body to a predetermined temperature,

said device further comprising, a container-shaped jacket formed of a heat conductive material, said jacket including an annular surface part defining an opening in said jacket, said body being mounted within said jacket in spaced heat-insulating relationship therewith, said surface part of said body being substantially flush with said annular surface part so that said annular surface part is in heat conductive relationship with the skin surface when said surface part of said body is in heat conductive relationship with the skin surface, said jacket further including second thermostating means for thermostating said jacket to such a temperature that the heat transport or heat flux from said body is substantially unidirectional, whereby the spaced heat-insulating relationship between said body and said jacket enables said jacket to establish, in operation, a virtual heating jacket in the skin beneath said annular surface part so as to substantially direct all heat flow from said body to skin layers directly beneath said body.

4,539,995

X-RAY TRANSMISSIVE ELECTRODE-SHIELDED WIRE ASSEMBLY

Kiyoshi Segawa, Tokyo, Japan, assignor to Fukuda Denshi Kabushiki Kaisha, Tokyo, Japan

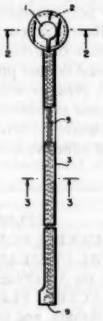
Division of Ser. No. 291,031, Aug. 7, 1981, Pat. No. 4,442,315. This application Dec. 30, 1983, Ser. No. 567,397

Claims priority, application Japan, Nov. 17, 1980, 55-160689; Nov. 17, 1980, 55-160690

Int. Cl.³ A61B 5/04

U.S. Cl. 128—639 5 Claims

1. An X-ray transmissive electrode-shielded wire assembly designed for extraction and transmission of electrical signals emanating from living bodies, said assembly comprising a base of an insulating sheet material comprising an enlarged portion and an integral elongated strip portion, an electrode and a narrow signal line both mounted on said base and made of electrically conductive material capable of being penetrated by X-rays, said electrode being formed on the surface of one side of said base at said enlarged portion, and said signal line being formed on the surface of the same side of said base strip portion and being electrically connected to said electrode, with said narrow signal line extending longitudinally along said base strip portion, a shielding layer of fine particles of electrically conductive material underlying said electrode and having an area larger than the area of said electrode, said shielding layer being adapted to shield said electrode and being mounted on the surface of the enlarged portion of said base opposite to the surface on which said electrode is mounted, a first layer of electrically conductive material having a width larger than the width of said signal line and arranged on said one side of said base strip portion overlying said signal line, a layer of insulating material located between said signal line and said first layer of electrically conductive material, a second layer of electrically conductive material having a width larger than the width of said signal line and arranged on the opposite side of said base strip portion underlying said signal line, and a first grounding line overlying said insulating layer and a second grounding line underlying said base strip portion, said first and second grounding lines being electrically connected to and arranged longitudinally of said first and second layers of electrically conductive material, said electrode shielding layer being electrically connected to said first and second grounding lines, said signal line being substantially shielded by said first and second layers of electrically conductive material and said first and second grounding lines.



4,539,996

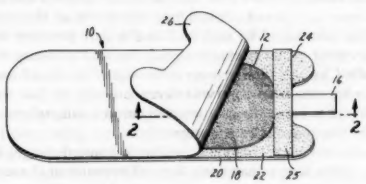
CONDUCTIVE ADHESIVE AND BIOMEDICAL ELECTRODE

Michael R. Engel, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 114,565, Jan. 23, 1980, abandoned. This application Jul. 18, 1983, Ser. No. 514,951

Int. Cl.³ A61B 5/04; A61N 1/04

U.S. Cl. 128—640 16 Claims



1. In an essentially dry biomedical electrode comprising an electrode plate having a first surface and a second surface, said electrode plate having means for electrical connection to a lead

wire of an electro-medical device, and a conductive material on said second surface of said electrode plate for enhancing electrical connection with the skin, the improvement wherein said conductive material comprises a swellable, dermally-nonirritating, conformable, cohesive, synthetic, ionic, hydrophilic polymer coating having a continuous covalently-bonded network throughout said coating formed by the essentially solventless process of:

(a) compounding an adhesive precursor comprising
  (1) a water-soluble polyhydric alcohol which is a liquid at about 20° C.;
  (2) an ionic unsaturated free radically polymerizable material which is soluble in said polyhydric alcohol;
  (3) a free radical initiator; and
  (4) a crosslinking agent of a multifunctional unsaturated free radically polymerizable material;
(b) coating said adhesive precursor on said second surface of said electrode plate or a releasable transfer sheet;
(c) polymerizing said coated precursor whereby an electrically conductive pressure-sensitive adhesive is formed on said electrode plate or transfer sheet; and
(d) when said adhesive is formed on said transfer sheet, transferring said adhesive to said second surface of said electrode plate.

4,539,997

METHOD AND DEVICE FOR CONTROLLING THE CUFF PRESSURE IN MEASURING THE BLOOD PRESSURE IN A FINGER BY MEANS OF PHOTO-ELECTRIC PLETHYSMOGRAPH

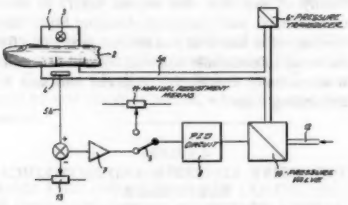
Karel H. Wesseling, Bunnik, and Benjamino de Wit, Kerk Avezaath, both of Netherlands, assignors to Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Oct. 27, 1982, Ser. No. 437,026

Claims priority, application Netherlands, Oct. 28, 1981, 8104879

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—667 **15 Claims**



1. An improved method for controlling cuff pressure in an indirect, non-invasive, continuous measurement of blood pressure in a finger by using a photo-electric plethysmograph providing a pulsatile plethysmographic signal and used with a fluid-filled pressure cuff, an electronic control circuit having an open and closed-control loop operation, an electric pressure valve connected to said cuff and a cuff pressure transducer providing a cuff pressure signal, the cuff pressure being controlled by the plethysmographic signal in closed-loop operation by means of a servo-reference level, so that the arterial volume is maintained at a preadjusted value, wherein the improvement includes the steps of:

continuously changing, within a control range, for initial open loop adjustment, the cuff pressure or the servo-reference level by means of a control wave form provided to the electronic control circuit;

periodically detecting each peak-trough differential amplitude of the pulsatile plethysmographic signal or cuff pressure signal;

comparing each said peak-trough differential amplitude with the preceding peak-trough differential amplitude; and

storing the associated value of peak-trough differential amplitude in the control range and the associated value of the cuff pressure or servo-reference level, and using said associated value of cuff pressure or servo-reference level at the end of the initial adjustment as the for set value measurement of the blood pressure after initial open-loop adjustment.

4,539,998

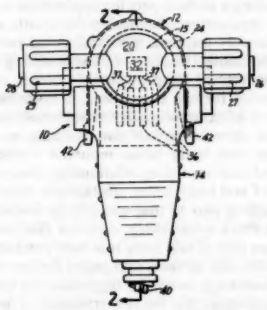
PRESSURE TRANSDUCER ASSEMBLY

Kenneth R. McCord, Menlo Park; James K. Bullock, Burbank; Henrick K. Gille, West Los Angeles, and Keith Gilroy, Valencia, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Apr. 29, 1983, Ser. No. 489,900

Int. Cl.³ G01L *7/08*

U.S. Cl. 128—675 **49 Claims**



1. A pressure transducer assembly for monitoring pressure in a fluid comprising:

a housing defining a chamber and having an inlet port and an outlet port in fluid-flow communication with the chamber;

an insulated body sealed within the chamber which forms separate first and second chambers within the housing with the first chamber in fluid-flow communication with the inlet port and outlet port;

a pressure transducer means secured in the insulated body and exposed to the first chamber for determining and converting fluid pressure within a fluid in the first chamber into electrical impulses;

a fluid pressure responsive media covering the pressure transducer means which is electrically nonconductive and which separates the pressure transducer means from any fluid present in the first chamber;

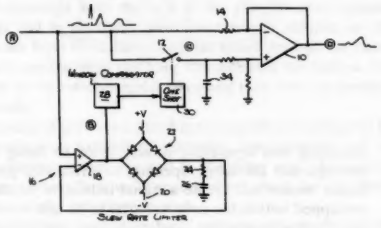
electrical conducting means connected to the pressure transducer means and extending through the insulated body and into the second chamber for providing electrical connection between the pressure transducer means in the first chamber and the second chamber; and

engagement means on the housing for providing a connection locus on the housing for electrical wiring which can be interconnected with the electrical conducting means.

4,539,999
METHOD AND DEVICE FOR SUBTRACTING A PACER SIGNAL FROM AN ECG SIGNAL

Thomas A. Mans, Harrington Park, N.J., assignor to Datascope Corp., Paramus, N.J.

Filed Jul. 22, 1983, Ser. No. 516,265
Int. Cl.³ A61B 5/04
U.S. Cl. 128—696 **5 Claims**



1. A pacer signal reject device for subtracting a pacer signal from an ECG signal, comprising:

subtraction circuit means having first and second inputs and an output wherein a signal applied to said second input is subtracted from a signal applied to said first input, and wherein a remainder signal is provided at said output;

first signal applying means for applying a patient's ECG signal, including actual heartbeat pulses and pacer signals, to said first input of said subtraction circuit means; and

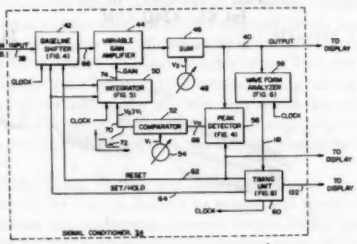
second signal applying means for applying a signal corresponding to said pacer signal to said second input of said subtraction circuit means, wherein the pacer signal is subtracted from said ECG signal, by said subtraction circuit means, and wherein said output of said subtraction circuit means provides an output corresponding only to the patients actual heartbeat pulses;

said second signal applying means comprises switch means coupled between said first and second inputs of said subtraction circuit means, means for detecting the initial rise-time of the pacer signal and for generating a detection signal corresponding thereto, and means for applying said detection signal to close said switch means for a timed period, wherein said timed period is in excess of the period of the main pulse of said pacer signal.

4,540,000
SIGNAL CONDITIONER FOR BIOLOGICAL SIGNALS

Richard F. Doherty, Seaford, and Anthony Pierry, Bayshore, both of N.Y., assignors to OCG Technology Inc., New York, N.Y.

Filed Dec. 15, 1983, Ser. No. 561,810
Int. Cl.³ A61B 5/04
U.S. Cl. 128—696 **15 Claims**



1. A signal conditioner suitable for conditioning an input signal composed of a time-varying component superposed on a fixed component subject to amplitude drift, the conditioner having an input terminal and an output terminal further comprising:

a baseline shifting unit coupled to said input terminal of said conditioner, said shifting unit including means for adjusting the minimum amplitude of the input signal relative to a baseline;

a variable gain amplifier coupled to an output terminal of said shifting unit, said variable gain amplifier including means for adjusting the maximum amplitude of the input signal relative to the baseline;

a source of reference signal for establishing the maximum amplitude of the input signal;

comparator means coupled between said reference source and said output terminal of said conditioner for providing a feedback signal;

means for providing a clock pulse signal;

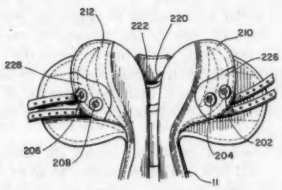
integration means responsive to the clock pulse signal and activated by the feedback signal for providing a gain control signal to said amplifier; and

timing means coupled to said shifting unit and to said integration means for setting and resetting said shifting unit and said integration means, said shifting unit and said integrating means including resettable means for providing an output signal having a magnitude dependent on the number of clock pulses in a sequence of said clock pulses, said shifting unit and said integrating means further comprising switching means responsive to a set timing signal for gating a sequence of the clock pulses to said resettable means, and said amplifier scaling the input signal subsequent to alteration of its baseline by said shifting unit.

4,540,001
HEART MONITOR FOR HORSES

John G. Ewing, 1515 Glenmere Rd., Greeley, Colo. 80631

Continuation-in-part of Ser. No. 446,321, Dec. 2, 1982, Pat. No. 4,478,225. This application Sep. 20, 1984, Ser. No. 652,203
Int. Cl.³ A61B 5/04
U.S. Cl. 128—706 **15 Claims**



1. A heart monitor for measuring the heart rate of a horse during training and other active periods comprising:

(a) saddle means mountable on a horse for supporting a rider;

(b) girth means operably attachable to said saddle means for securing said saddle means to a horse;

(c) electrode means operably mounted on said saddle means for providing touching electrical contact with the body of a horse mounted with said saddle means for detecting voltage changes on the skin surface of the horse and providing an electrical signal in response thereto;

(d) signal processing circuitry means for processing said electrical signal from said electrode means;

(e) display means for receiving said processed signal and generating a human readable display indicating the heart rate of a horse mounted with said saddle means; and

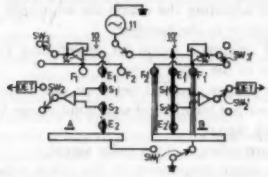
(f) power supply means for providing electrical energy to operate said signal processing circuitry means and said display means.

4,540,002

ELECTRICAL MEASURING SYSTEM PARTICULARLY USEFUL FOR THE NON-INVASIVE EXAMINATION OF BIOLOGICAL TISSUE

Dan Atlas, Hod Hasharon, Israel (45102)

Filed Sep. 30, 1982, Ser. No. 429,673
Claims priority, application Israel, Apr. 22, 1982, 65581
Int. Cl.[3] A61B *5/04*
U.S. Cl. 128—734 **7 Claims**



1. A system particularly useful for the non-invasive examination of biological tissue comprising a first group of electrodes adapted to be applied to one portion of the subject under examination; a second group of electrodes corresponding to those of said first group, and adopted to be applied to another portion of the subject under examination to serve as a reference with respect thereto, each said group, comprising:

a first pair of electrodes, constituting excitational electrodes, adapted to be applied to the respective portion of the subject under examination in spaced relationship to each other and to be connected to a source of constant-amplitude current;

a second pair of electrodes, constituting sensing electrodes, adapted to be applied to the respective portion of the subject under examination in alignment with, and in the space between, the respective first pair of excitational electrodes, and in spaced relationship to each other, so as to measure the impedance of the respective portion of the subject under examination by measuring the voltage drop between said sensing electrodes;

a third pair of electrodes, constituting focusing electrodes, adapted to be applied to the respective portion of the subject under examination in alignment with, and on opposite sides of, one of the respective excitational electrodes, transversely of the line between the respective two excitational electrodes, and connected to said one excitational electrode such that the potential of the focusing electrodes follows that of the respective one excitational electrode;

and synchronized switching means for alternatively connecting said first pair of electrodes to an excitation source while disconnecting said second pair therefrom, and then connecting said second pair of electrodes to said excitation source while disconnecting said first pair of electrodes therefrom.

4,540,003

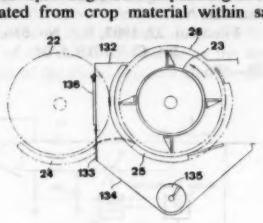
OFFSET GRAIN LOSS SENSOR FOR COMBINE HARVESTERS

Guy H. J. Osselaere, Gent, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Feb. 22, 1984, Ser. No. 582,246
Claims priority, application United Kingdom, Feb. 25, 1983, 8305219
Int. Cl.[3] A01F *12/00*
U.S. Cl. 130—27 T **7 Claims**

1. In a combine harvester having a mobile frame; a rotary threshing and separating means mounted on said frame within a housing to thresh and separate grain from crop material received thereby, said rotary threshing and separating means including a discharge opening through which crop material is discharged therefrom to be removed from said combine harvester, the improvement comprising:

grain loss sensor means mounted to one side of said rotary threshing and separating means to permit grain which has been separated from crop material within said rotary



threshing and separating means, prior to being ejected through said discharge opening, to strike said grain loss sensor means and create a signal indicative of the grain entrapped within the crop material to be ejected through said discharge opening, said grain loss sensor means including a sensor forming a part of said housing.

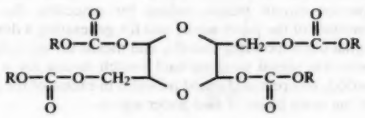
4,540,004

SMOKING COMPOSITIONS CONTAINING A FLAVORANT-RELEASE ADDITIVE

Kenneth F. Podraza, and Yoram Houminer, both of Richmond, Va., assignors to Philip Morris, Incorporated, New York, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,424
Int. Cl.[3] A24B *3/12, 15/40*
U.S. Cl. 131—277 **7 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and non-tobacco substitutes, and (2) between about 0.0001 and 2 weight percent, based on the total weight of filler, of a tetracarbonate ester flavorant-release additive corresponding to the formula:



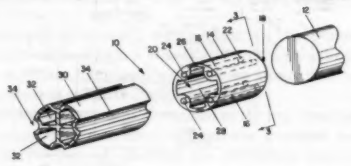
where R is a substituent selected from aliphatic, alicyclic and aromatic radicals.

4,540,005

CIGARETTE HAVING A MOUTHPIECE

Daniel V. Cantrell, Prospect, and Dale A. Halverstadt, Louisville, both of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Dec. 5, 1983, Ser. No. 558,222
Int. Cl.[3] A24D *3/04*
U.S. Cl. 131—336 **24 Claims**



1. A cigarette comprising:

a generally cylindrical tobacco column;

a generally cylindrically shaped impermeable plug member

located in coaxial abutment with one end of the tobacco column;

a plurality of smoke flow through capillaries formed through the plug member generally longitudinally of the plug member such that each capillary has an open inlet at the end of the plug member in abutment with the tobacco column and an open outlet at the opposite end of the plug member;

a generally cylindrical, tubular mouthpiece located in coaxial abutment with the end of the plug member opposite that end in abutment with the tobacco column, so that smoke from the tobacco column flows through the smoke flow capillaries in the plug member into the hollow interior of the tubular mouthpiece and then into the smoker's mouth;

a plurality of grooves formed in the peripheral surface of the mouthpiece extending generally longitudinally of the mouthpiece from one end to the other end, the grooves being generally equally spaced apart about the circumference of the mouthpiece; and,

air permeable tipping material circumscribing the mouthpiece and plug member, and overlapping a portion of the tobacco column adjacent the plug member, thereby providing for the flow of only ventilating air through the tipping material into the grooves of the mouthpiece so that only ventilation air flows in the grooves to the smoker's mouth.

4,540,006

HAIR ROLLER

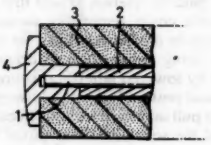
Harvey E. Collis, 12 Fitzroy Rd., London NW 1, England

Filed Nov. 9, 1982, Ser. No. 440,288

Claims priority, application United Kingdom, Nov. 9, 1981, 8133779; Jan. 22, 1982, 8201853

Int. Cl.[3] **A45D** *2/02*

U.S. Cl. 132—39 **6 Claims**



1. A roller for curling or waving hair comprising a length of bendable wire within a continuous elongate jacket of cushioning material, the jacket continuously extending substantially the full length of the wire, the roller being sufficiently bendable to be folded by a user for defining a fold in the roller and folded portions of the roller on opposite sides of the fold, the roller being resilient such that the roller retains, during curling treatment using the roller, the position into which the roller is folded, and the continuous jacket being of such length that it extends over the folded portions and the fold joining the folded portions,

the roller being shaped and dimensioned such that it is adapted for use by folding to secure and maintain hair between the cushioning material on the folded portions until the hair has been set to the desired wave or curl, and

the wire is, along its length, unsecured within the jacket for enabling some relative movement between the wire and the jacket.

4,540,007

COSMETIC APPLICATOR AND CONTAINER ASSEMBLY FOR ASEPTIC APPLICATION OF COSMETICS

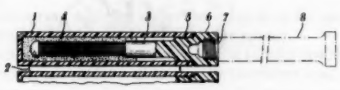
Claudio Carracoy, Rome, Italy, assignor to Oftalysine S.r.l., Rome, Italy

Continuation of Ser. No. 361,596, Mar. 25, 1982, abandoned. This application Nov. 1, 1984, Ser. No. 667,071

Claims priority, application Italy, Oct. 28, 1981, 36103/81[U]

Int. Cl.[3] **A45D** *40/30*

U.S. Cl. 132—88.5 **2 Claims**



1. A cosmetic applicator and container assembly comprising:

a plurality of disposable cylindrical containers, a corresponding plurality of applicators, and a single extracting and gripping unit for the applicators of the assembly;

the plurality of disposable cylindrical containers being aligned in a linear array and the adjacent containers in the array being integrally joined together by connecting tabs of breakable material, each container having an internal reservoir holding cosmetic material and having a closed bottom end and an open mouth end, the same cosmetic material being contained in the reservoirs of all of the joined containers;

each of the plurality of applicators being disposed in sealing relation with the open mouth end of a container, each applicator having a first portion comprising a cosmetic applying stick extending into the internal reservoir of cosmetic material, a second portion integral with the first portion including a cylindrical section fitting closely into the open mouth end of the cylindrical container and forming a hermetic seal therefor, and a third portion integral with the second portion and of larger diameter than the second portion and formed with an external shoulder adjacent to the second portion and terminating in a surface extending substantially perpindicularly to the axis of the container, the terminal surface being formed with a hole having a threaded portion and an internal recess extending axially inwardly from the threaded portion; and

the extracting-gripping unit comprising a handle and a tailpiece integral with the handle, the handle having a shoulder adapted to engage the terminal surface of the third portion of an applicator, and the tailpiece having a threaded portion adapted to be screwed into the threaded hole of the third portion of an applicator and also having an integral imporforate axial projection extending beyond the threaded portion to be received in the internal recess of the third portion of an applicator;

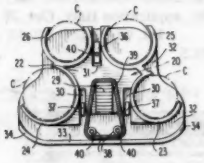
whereby a plurality of separate portions of the same cosmetic material are provided in a unitary container assembly, each portion being hermetically sealed until the corresponding applicator is removed so that any contamination of a portion of cosmetic material in one reservoir can not affect the portions of cosmetic material contained in the other reservoirs of the assembly, each applicator being readily removable from the container by threaded connection thereto of the extracting-gripping unit, the tailpiece of the extracting-gripping unit being easily guided into the hole of each applicator by axial projection thereon so as to facilitate connection of the threaded portion of the tailpiece of the extracting gripping unit with the threaded portion of the hole of the applicator, the axial projection also providing added rigidity to the applicator when it is joined to the extracting-gripping unit while permitting easy separation of the applicator from the extracting-gripping unit.

4,540,008

COIN CARRIER WITH PLURAL SLIDABLE POCKETS

Kent D. Murphy, 4401 East-West Hwy., Bethesda, Md. 20014

Filed Jul. 12, 1983, Ser. No. 513,006
Int. Cl.[3] G07D 9/00
U.S. Cl. 133—5 A 13 Claims



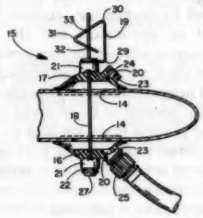
1. A coin carrier comprising a pocketed coin slide adapted to contain stacks of coins, a housing receiving the coin slide and being guidingly engaged therewith so that the coin slide can be moved on a linear path relative to the housing, the housing including top and bottom walls forming at least partial closures for the tops and bottoms of the pockets of said coin slide, resilient means connected between the coin slide and housing and biasing the coin slide to a retracted position on the housing, a manual operator on the coin slide accessible from the exterior of the housing by means of which the coin slide and the pockets thereof and all of the stacks of coins in the pockets can be moved on said linear path to an extended coin removal position relative to the housing, and the pockets of the coin slide and the housing having cooperative passage means enabling selective removal of coins from the tops of said pockets when the coin slide is in the extended position and blocking the removal of coins when the coin slide is in the biased retracted position.

4,540,009

FLUSHING DEVICE FOR OUTBOARD MOTORS

Michael A. Karls, Hilbert, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jun. 25, 1984, Ser. No. 624,325
Int. Cl.[3] B08B 9/00
U.S. Cl. 134—167 R 7 Claims



1. A flushing device for supplying water to cooling water inlets located on opposite sides of an outboard propulsion unit, said device comprising:

(A) a pair of sealing elements for covering the cooling water inlets, at least one of said sealing elements including a water passage for supplying water to one of said water inlets;

(B) a connecting means extending through said water inlets; and

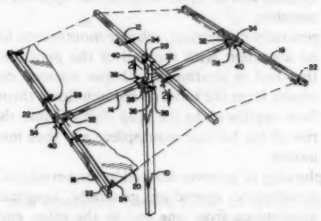
(C) an attachment means for attaching said sealing elements to said connecting means and holding said sealing elements in position covering said inlets.

4,540,010

PORTABLE KNOCK-DOWN CANOPY

Jim May, 12110 SE. Pine, Portland, Oreg. 97216

Filed Jan. 11, 1984, Ser. No. 569,904
Int. Cl.[3] A45F 1/00
U.S. Cl. 135—99 3 Claims



1. A portable knock-down canopy comprising

a vertical support post having upper and lower ends arranged to be secured at its lower end to a supporting surface,

a first horizontal bar,

a first bracket having a socket portion removably receiving the top end of said post and also having a tubular open ended portion disposed at right angles to said socket portion and removably receiving said first bar,

a second horizontal bar having opposite ends,

a second bracket having a pair of tubular portions disposed at right angles to each other and removably receiving respectively the second bar and said post,

the tubular portion of said second bracket that receives said support post having securing means therein for adjustably securing said second bracket vertically on said post below the upper end thereof,

third and fourth horizontal bars having opposite ends,

third and fourth brackets each having a socket portion receiving respectively opposite ends of said second bar and also having a tubular open ended portion disposed at right angles to said socket portion of its bracket receiving respectively the third and fourth bars and supporting the latter in parallel relation to said first bar but therebelow,

and a flexible cover removably secured to said third and fourth bars in draped relation over said first bar,

said cover being tightened in its draped relation over said first bar by lowered adjusting securement of said second bar on said post and in being lowered, said cover is tensioned to pull said third and fourth bars toward each other and hold the socket portions of the respective third and fourth brackets on the ends of said second bar.

4,540,011

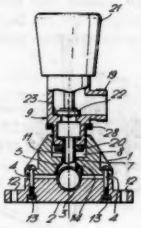
METHOD AND DEVICE FOR FORMING A BRANCH CONNECTION IN A PIPE

George A. Croxford, and Anthony M. Hackett, both of Peterborough, England, assignors to Hotpoint Limited, England

Filed Aug. 18, 1983, Ser. No. 524,371
Claims priority, application United Kingdom, Aug. 25, 1982, 8224433
Int. Cl.[3] F16K 43/00
U.S. Cl. 137—15 17 Claims

16. A method of forming a branch connection in a fluid carrying pipe by squeezing a longitudinal portion of the pipe between a groove in a saddle member and an opposed groove in a backing member and turning in one of said members a cutting element sealingly rotatable in a fluid passageway in that member, the cutting element being turned about an axis transverse to the pipe axis, the cutting element having a cutting edge spaced from the axis of rotation of the cutting element and the cutting element simultaneously moving toward the axis of the pipe as it rotates forcing the cutting edge to progres-

sively cut through the wall of the pipe in a circular path, the axis of rotation of said cutting element being offset from said pipe axis so that as the cutting edge progressively cuts around the path it will cut from a beginning at one point on said path to an end on another point on said path spaced from said first point with a relatively small part of said wall uncut to form a part-circular tongue joined to the remainder of the pipe wall by



a narrow web between said points, the cutting edge accordingly forming a cut in the pipe which starts at the side thereof at which the axis of rotation of the cutting element is spaced from the pipe axis, and continues through the pipe wall and exits the pipe at the same side thereof, but spaced from the entry to the cut, further operation of the cutting element depressing the tongue inwardly while leaving the tongue attached to the pipe by said narrow web.

4,540,012

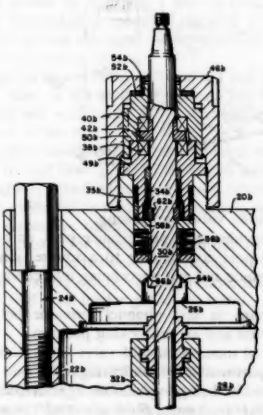
TEMPERATURE SENSITIVE VALVE BONNET ASSEMBLY

Charles D. Bridges, Houston, Tex., assignor to Gray Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 486,146, Apr. 18, 1983,. This application Nov. 1, 1983, Ser. No. 547,808

Int. Cl.[3] F16K *17/38, 41/14*

U.S. Cl. 137—72 **8 Claims**



1. In a valve having a normally non-rising stem which passes out of a chamber in a valve housing through a bonnet having a central passage in which a packing normally seals between the valve stem and the valve bonnet, a bearing assembly journaling the valve stem relative to the bonnet, a retainer normally secured to said bonnet, a ring of fusible material disposed axially inward of the retainer and cooperating therewith for restraining the stem and bearing assembly against substantial outward movement, a vent through which the fusible material may pass after melting when subjected to an abnormally high temperature for allowing the valve stem and bearing assembly to move axially outward, an annular sealing surface circumferentially provided on the valve stem, and a second sealing surface provided on said bonnet within said chamber, the two sealing surfaces normally remaining spaced axially apart but which become annularly engaged in a sealed condition upon the axially outward movement of the valve stem, the improvement comprising:

a tubular spacer, surrounding the valve stem and being restrained from outward axial movement by the fusible ring;

an annular spring disposed about the valve stem for exerting an outward axial force on the tubular spacer;

a compression ring, cooperating with the tubular spacer and the annular spring for transmitting the outward axial force therebetween, thereby compressing the fusible ring between the tubular spacer and the retainer.

4,540,013

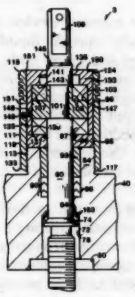
FIRE RESPONSIVE STEM RETENTION APPARATUS

Richard G. Furley, Stroud, England, and John H. Fowler, Spring, Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Oct. 13, 1983, Ser. No. 541,451

Int. Cl.[3] F16K *17/38*

U.S. Cl. 137—75 **16 Claims**



1. A fire responsive stem retention apparatus for a valve having a valve body with a flow passage therethrough and an open upper end, a valve chamber intersecting the flow passage within the valve body, a bonnet closing the upper end of the valve body with a bore therethrough and an annular backseat in the bore, a stem within the valve chamber and extending through the bonnet bore above the bonnet, bearing means mounted on the stem above the bonnet, stem packing means in the bonnet around the stem, a gate mounted on the stem within the valve chamber for movement up and down the stem for reciprocation across the flow passage to alternately open and close the flow passage upon rotation of the stem, and a backseat flange on the stem within the bonnet bore in spaced relationship with the bonnet backseat under normal environmental conditions, comprising:

an outer hollow sleeve fixedly mounted on top of the bonnet around the stem;

an inner cap disposed around the bearing means and received within said sleeve in close fitted relationship therewith, said inner cap having a shoulder engaging the upper surface of the bearing means, said inner cap being connected to said outer sleeve under such normal environmental conditions by a thin layer of fusible material between said inner cap and outer sleeve, said connection preventing upward movement of said inner cap within said sleeve thereby preventing upward movement of the bearing means and stem and maintaining the backseat

flange on the stem in spaced relationship with the bonnet backseat;

said thin layer of fusible material being melted in response to extreme heat, as under fire conditions, releasing said inner cap from said outer sleeve and allowing upward movement of said cap within said sleeve, thereby permitting upward movement of the bearing means and stem and sealing engagement of the backseat flange on the stem with the bonnet backseat for establishing a secondary fire resistant seal as a backup seal for the stem packing means.

4,540,014

HYDRAULIC MEMORY DEVICE

Iosif Baumberg, 54 Bay 29 St., Brooklyn, N.Y. 11214

Filed Jan. 25, 1984, Ser. No. 573,607
Int. Cl.³ F04F *10/00*
U.S. Cl. 137—123 **13 Claims**

1. A hydraulic memory device, comprising

two substantially upright liquid-conducting passages each having upper and lower ends;

a liquid input member communicating with the upper ends of said passages for supplying a liquid into the latter;

two liquid output members each connected with the lower end of a respective one of said passages so as to receive the liquid from the respective passage into the respective liquid output member and to discharge the liquid from the latter; and

liquid retaining means in each of said liquid output members and formed so that if during a preceding liquid supply the liquid was flowing through one of said passages a small quantity of the liquid remains in the liquid output member connected with said one passage, and therefore with delivery of a control signal in the region of said liquid input member during a subsequent liquid supply the liquid will be flowing through the other of said passages, and vice versa, so as to provide operation of the device as a trigger with one control input and two outputs.

4,540,015

ROTARY SHEER VALVE WITH WASH AND PURGE STATION

Melvin S. Henriksen, Santa Ana, and Richard C. Meyer, La Habra, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 30, 1983, Ser. No. 509,900
Int. Cl.³ B08B *3/02, 9/02*
U.S. Cl. 137—240 **4 Claims**

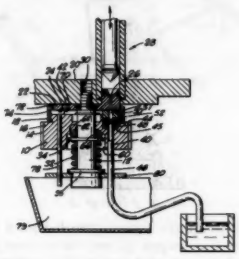
1. A shear valve for selectively transferring fluids from a plurality of fluid conduits to a fluid element comprising:

a first member having a port in fluid communication with said fluid element and providing a sealing surface;

a second member having a plurality of ports each of which is in fluid communication with one of said fluid conduits, and providing a sealing surface for each of said ports, said second member being movable relative to said first member to selectively align said ports in said second member with said port in said first member;

first sealing means for providing fluid communication between said first member port and one of said second member ports when such second member port is aligned with said first member port and for closing each of said second member ports to any fluid communication when said second member is moved as that said ports are not aligned with said first member port, said first sealing means separating said first and second members to form a passage therebetween;

second sealing means for providing a seal between said first and second members to enclose said passage;



means for introducing a wash solution into said passage for cleansing exposed sealing surfaces of said first and second members within said passages; and

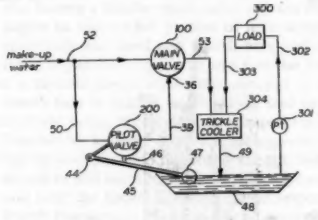
a drain port communicating with said passage for removal of said solution from said passage.

4,540,016

FLOW-CONTROL SYSTEM WITH PRESSURE-RESPONSIVE VALVE

Hans H. Sladky, Fabriciusstrasse 16, 2000 Hamburg 71, Fed. Rep. of Germany

Filed Jul. 30, 1982, Ser. No. 403,707
Int. Cl.³ B08B *9/00;* **F16K** *31/34*
U.S. Cl. 137—244 **12 Claims**



1. A flow-regulating valve comprising:

a valve body provided with an entrance port, an exit port, and a control port connectable to a source of pressure fluid, said entrance and exit ports being interconnected by a channel;

flow-control means in said channel movable between a blocking position and an unblocking position;

a resiliently biased member in said valve body bounding a pressure compartment communicating with said control port, said member being repressible against the biasing force thereof by a pressure fluid admitted through said control port into said compartment, said body being further provided with a restricted passage leading from said compartment to a location in said channel lying at a downstream side of said flow-control means; and

a rod connecting said member with said flow-control means for moving same from said blocking position into said unblocking position in response to the application of said pressure fluid to said control port, said rod traversing said passage with limited clearance facilitating the dislodgment of accumulating solids by movements of said rod, said

passage being cut off by said member from said control port in said blocking position but communicating therewith in said unblocking position to provide a leakage path for said pressure fluid, said clearance being an annular space separating said rod from a bushing surrounding same in a part of said passage, said bushing having a calibrated inner diameter smaller than that of said passage, said rod being provided with a plug coming to rest against said bushing under said biasing force in the absence of countervailing fluid pressure applied to said control port, thereby obstructing said clearance in said blocking position.

4,540,017

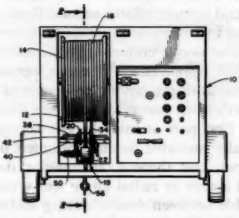
HOSE FEEDER GUIDE APPARATUS

Charles J. Prange, 4875 Sellers Rd., Cridersville, Ohio 45806

Filed Sep. 2, 1983, Ser. No. 529,017

Int. Cl.³ B65H *75/34*

U.S. Cl. 137—355.12 **13 Claims**



1. A hose feeder guide apparatus for a mobile sewer cleaning machine having a hose reel mounted in a hose reel compartment comprising:

hose guide roller means mounted on said machine adjacent an opening through which hose is payed out or reeled in;

pivot mount means pivotally mounting said hose guide roller means for side to side pivotal movement for evenly winding said hose onto said hose reel;

tension means for applying a tension to said hose; said tension means being mounted on said pivotally mounting means so that said hose passes between said guide roller and said tension means;

said tension means being constructed and arranged to allow said hose to be easily positioned between said tension means and said guide roller without removing tools attached to the end of said hose;

said tension means comprising a tension roller in juxtaposition to said hose guide roller means mounted on a frame swingably attached to said pivot mount means for said hose guide roller means for retaining said hose between said respective rollers;

opening means for opening said frame to insert or remove said hose from between said respective rollers;

whereby paying out or reeling in hose is readily controlled with said hose feeder guide apparatus.

4,540,018

PRESSURE CONTROL VALVE

Jörg Dantlgraber, Lohr-Sackenbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

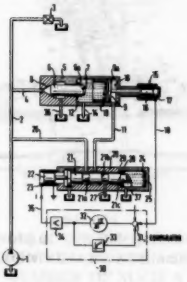
Filed Aug. 19, 1982, Ser. No. 409,659

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134065

Int. Cl.³ F16K *17/06*

U.S. Cl. 137—540 **8 Claims**

1. In a control device for controlling the pressure in a pressure line connected to a load, comprising a pressure control valve receiving pressurized fluid from said pressure line when a predetermined pressure in the pressure line is reached, said pressure control valve including a closure member, and a pilot valve to adjust the closure member of said pressure control valve, the improvement wherein said pilot valve comprises a solenoid valve having three defined positions, said pressure control valve further comprising a control chamber for pressure fluid for biassing the closure member, a piston to which the pressure in said control chamber is applied, and which in turn applies the pressure in the control chamber to said closure member, said control chamber of the pressure control valve in one of said positions of the solenoid valve being isolated, in a second of said positions being supplied with pressure fluid and in a third position being released of pressure fluid, said solenoid valve including a solenoid which determines said three posi-



tions of said solenoid valve and an electrical three point switch means for controlling said solenoid to set the position of the solenoid valve selectively to one of said three positions, sensing means connected to said pressure control valve for producing an output signal related to the pressure in the pressure chamber, and comparator means receiving the output signal from the sensing means for comparing said output signal with a predetermined signal to produce a control signal, said comparator means being connected to said three point switch means for supplying said control signal thereto to operate said three point switch means to produce an output signal therefrom to set the position of the solenoid valve selectively to one of said three positions.

4,540,019

BELLOWS SEALED STEM FOR ROTARY VALVE

James R. Owoc, and Richard P. Tremblay, both of Pittsburgh, Pa., assignors to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Continuation of Ser. No. 357,050, Mar. 11, 1982, Pat. No. 4,462,422. This application May 14, 1984, Ser. No. 609,718

The portion of the term of this patent subsequent to Aug. 31, 1984, has been disclaimed.

Int. Cl.³ F16K *41/10*

U.S. Cl. 137—557 **12 Claims**

1. An actuating device for movement of a member mounted in an enclosure comprising,

actuating means rotatable about an axis for moving said member,

a stem extending between said member and said actuating means,

said stem having an upper end portion,

bearing means carried by said actuating means for connecting said actuating means to said stem upper end portion to transmit rotation from said actuating means to said stem,

said stem having a lower end portion connected to said member for transmission of rotation from said actuating means to said member,

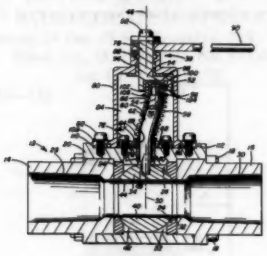
said bearing means being positioned on said actuating means laterally displaced from said actuating means axis,

said stem upper end portion having an axis of rotation and said stem lower end portion having an axis of rotation,

said stem lower end portion axis being axially aligned with said actuating means axis,

said stem upper end portion axis being laterally displaced from said actuating means axis and said stem lower end portion axis to provide said stem with a bent configuration,

said stem upper end portion being rotatably received in said bearing means to maintain said stem upper end portion axis in spaced relation to said actuating means axis,



a bellows surrounding said stem to provide a hermetic seal around said stem between said enclosure and said actuating means,

said bellows having a bent configuration corresponding to the bent configuration of said stem,

said stem having an outer surface and said bellows having an inner surface positioned closely adjacent to said stem outer surface such that said stem supports said bellows against lateral deflection when subjected to pressure forces to prevent distortion of said bellows, and

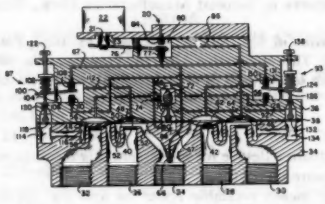
wear resistant means positioned between said stem outer surface and said bellows inner surface for reducing the frictional wear between said bellows and said stem.

4,540,020

SUPPLY CONTROL VALVE WITH INTEGRAL PRESSURE LIMITER

John F. Taplin, 15 Sewall St., West Newton, Mass. 02165

Filed Apr. 20, 1984, Ser. No. 602,420
Int. Cl.³ F15B *13/043*
U.S. Cl. 137—596.15 **12 Claims**



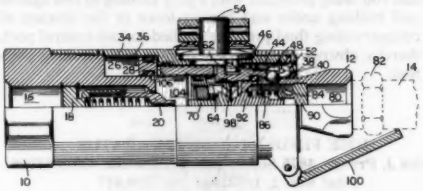
10. A pilot operated four-way supply and waste control valve comprising two main supply valves and two main waste valves for alternately supplying and exhausting supply fluid to and from two load ports, control valve means responsive to a control input for opening and closing the main supply and waste valves, and a fluid switch responsive to the fluid pressure in one of said load ports for closing a main supply valve to said load port when the fluid pressure in said load port reaches a preset value independent of the control input to the control valve means, each of the main valves and the fluid switch being driven by fluid pressure taken from the supply fluid.

4,540,021

BALANCED VALVE COUPLING

Russell L. Rogers, Murith, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Mar. 21, 1984, Ser. No. 591,808
Int. Cl.³ F16L *37/28, 37/22*
U.S. Cl. 137—614.05 **4 Claims**



1. In a fluid coupling for interconnecting pressurized fluid systems comprising, in combination, a first part having an axial passage having an inner end connected to a first fluid system and an open outer end, a second part having an axial passage having an inner end connected to a second fluid system and an outer end adapted to be received within said first part passage outer end, a tubular sleeve concentrically mounted upon said first part for axial displacement thereon between first and second positions, said sleeve having an open end located adjacent said first part's open end at said sleeve's first position and drawn into said first part at said sleeve's second position, a plurality of radially movable detents mounted on said sleeve adjacent said open end thereof, an annular detent retainer mounted on said sleeve in radial alignment with said detents axially displaceable between detent locking and detent release positions, a spring defined on said sleeve biasing said detent retainer toward said detent locking position, said second part outer end being receivable within said sleeve open end and having an annular groove defined therein for receiving said detents when said retainer is in said detent locking position, a manual actuator mounted upon said first part operatively connected to said sleeve for displacing said sleeve between said first and second positions, an expansible motor chamber defined in said first part, a piston defined on said sleeve within said motor chamber, said chamber selectively communicating with said first part first fluid system whereby the pressure thereof augments movement of said sleeve from said first position to said second position, said second part being connected to said sleeve at its first position and drawn into said first body at said sleeve's second position, a first valve within said first part passage, a second valve within said second part passage, said first valve including an annular axially reciprocal booster piston within said first part passage for axially biasing said first valve toward said second valve to open said second valve when said sleeve is in said second position and said parts are fully coupled.

4,540,022

CHOKE FOR DRILLING OR PRODUCTION USE

Harry R. Cove, 3007 - 110 St., Edmonton, Alberta, Canada, assignor to Harry R. Cove and Gary R. Williams, both of, Canada

Filed Jun. 1, 1982, Ser. No. 383,550
Int. Cl.³ F16K *11/07, 3/24, 47/04*
U.S. Cl. 137—625.3 **1 Claim**

1. A choke having a fluid flow path therethrough which is to be restricted or closed, comprising:

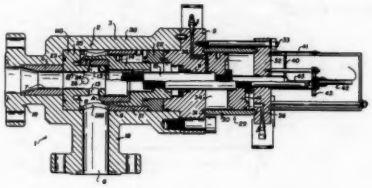
a hollow body assembly having an inlet bore and an outlet bore substantially at right angles and a main bore which is an extension of the outlet bore and which communicates with the inlet bore;

a stationary member positioned in the main bore, said stationary member comprising a tubular substantially open-ended nozzle member forming a first bore which communicates with the outlet bore and is substantially aligned

therewith, said nozzle member forming only first and second pairs of substantially diametrically opposed ports, extending through its side wall, the centres of the second pair of ports being spaced from the centres of the first pair of ports in a direction away from the throttling member, the extent of spacing being sufficient so that the two pairs of ports do not overlap substantially, the area of each first port being substantially greater than the area of each second port, whereby fluid may enter the choke through the inlet bore and pass through the ports as impinging streams and continue out through the outlet bore;

the inlet bore being substantially aligned with the ports to provide a generally straight upstream flowpath into the first bore;

a moveable tubular throttling member positioned within the main bore and adapted to be moved only over the outside surface of the nozzle member from its open-ended end to restrict the ports and thereby restrict the cross-sectional



area of the flow path and accelerate the flow, said throttling member having a forward end surface which is exposed to the erosional effects of accelerated flow entering the restricted ports, said throttling member further having an annular first seal surface which is positioned outside and to the rear of said end surface, where it is remote from that part of the flow path where acceleration of the fluid flow occurs;

means for moving the throttling member as required to open and restrict the ports;

said stationary member having a second annular seal surface spaced radially outwardly from the ports and being longitudinally spaced away from them in a direction away from the throttling member, whereby said second seal surface is out of the line from the inlet bore to the ports and is therefore remote from that part of the flow path where acceleration of the fluid flow occurs, said second seal surface being adapted to meet with the first seal surface to prevent further flow through the ports.

4,540,023

SANITARY MIXING VALVE

Manfred Pawelzik, Soest, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Nov. 29, 1983, Ser. No. 556,152

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1982, 3244121

Int. Cl.³ F16K *11/06*

U.S. Cl. 137—625.17 **4 Claims**

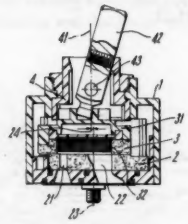
1. A mixing valve comprising:

a housing having an axis;

a valve seat disk having inlet water passages and an outlet passage and fixed in said housing so as to be centered on said axis, said passages being spaced around said axis;

a control disk disposed on said valve disk and having a mixing passage, said control disk being rotatable relative to said valve seat disk to control the mixture ratio and being radially displaceable relative to said valve seat disk to adjust the flow rate, said control disk being rotatable about an axis of rotation parallel to but offset by a predetermined amount from the center of said valve seat disk and said housing axis in the direction of said inlet passages;

a rotatable member received in said housing and confined to rotation about said axis of rotation; and



means on said member for rotating and radially displacing said control disk.

4,540,024

ROTATING HYDRAULIC DISTRIBUTOR AND METHOD OF MANUFACTURING CHAMFERED CLOSING EDGES OF A ROTATING MEMBER OF SUCH A DISTRIBUTOR

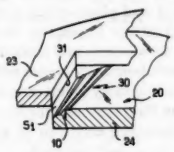
Juan S. Bacardit, Barcelona, Spain, assignor to Bendiberica, S.A., Barcelona, Spain

Filed May 23, 1983, Ser. No. 497,303

Claims priority, application France, May 26, 1982, 82 09133

Int. Cl.³ E03B *3/00*

U.S. Cl. 137—625.21 **7 Claims**

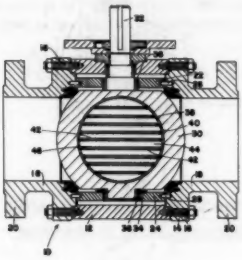


1. A rotating hydraulic distributor, comprising at least two axially adjacent rotating members, (**20, 23**) adapted for relative rotation through a limited angular range and about a common axis (O) and under the action of control means, said rotating members (**20, 23**) having mutually cooperating axial surfaces each formed with at least one aperture having at least one edge and opening in the axial direction toward the aperture of the other adjacent rotating member, lateral edges (**30, 31**) of the adjacent apertures mutually cooperating to define an elongated fluid flow passage (θ, S) whose cross-sectional area is adjustable by relative rotation between said rotating members (**20, 23**), at least one (**30**) of the mutually cooperating lateral edges (**30, 31**) being formed with chamfer means (**30**) having a profile (**10**) comprising a surface (**30**) formed by a plurality of planes whose lines (**300**) of intersection form non-parallel generatrices (**300**) which converge substantially toward a zone (C) offset from the common axis (O) of said two rotating members (**20, 23**) to define said fluid flow passage (θ,S) as a passage (ϑ, S) having a substantially constant axial width (R_1; R_2) over the length of the passage, wherein first (R_1) and second (R_2) axial separation distances between the chamfer means (**30**) and other lateral edge (**31**) are substantially equal, for each relative angular position (α) between said rotating members (**20, 23**) and within at least a portion of said limited angular range.

4,540,025
THROTTLING BALL VALVE

Howard L. Ledeen, Pasadena, and William P. Ledeen, Cupertino, both of Calif., assignors to Grove Valve and Regulator Company, Oakland, Calif.

Filed Mar. 28, 1983, Ser. No. 479,796
Int. Cl.³ F16K *47/02*
U.S. Cl. 137—625.32 **4 Claims**

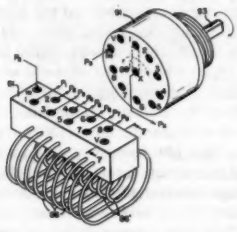


1. A throttling valve comprising:
a valve body with aligned flow passages;
a valve plug rotatable in said valve body intermediate said flow passages;
a flow passageway through said valve plug; and
means sealing between said body and said plug around said flow passageway;
said valve being further characterized in that it includes:
first array of a plurality of plates mounted across said passageway transverse to the axis of rotation of said plug and closely spaced to define a multiplicity of narrow flow channels between them;
a second array of a plurality of plates mounted across said passageway downstream of said first array thereof;
the leading edges of said plates being streamlined to divide smoothly a fluid stream impinging thereon and produce smooth laminar flow across and spaced from the surfaces of said plates with boundary layers adjacent to said surfaces, so that the boundary layers so generated produce a frictional drag on fluid flow and further confine the effective flow space between each pair of adjacent plates.

4,540,026
PNEUMATIC POTENTIOMETER

William D. Ellsworth, 39 Red Maple Dr., Fairport, N.Y. 14450

Filed Nov. 28, 1983, Ser. No. 555,568
Int. Cl.³ F16K *11/085*
U.S. Cl. 137—862 **12 Claims**

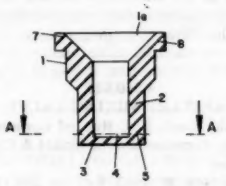


1. An instrument for selectively supplying any one of a plurality of different, predetermined fluid pressures to a fluid operated device, comprising
means defining an elongate, tubular plenum having an inlet at one end thereof, an outlet at its opposite end, and a plurality of spaced exhaust openings formed therein at axially spaced points intermediate its ends,
means for connecting said inlet to a supply of fluid under a first predetermined pressure,
means for connecting said outlet to a system maintained at a pressure lower than said first predetermined pressure, so that said fluid flows through said plenum from said inlet to said outlet,
said plenum having a substantially uniform diameter throughout its length, whereby the pressure of said fluid drops in a substantially linear manner during its passage through said plenum, and thus presents a different, predetermined fluid pressure at each of said exhaust openings in said plenum, and
valve means having a single output port disposed to be secured in communication with said fluid operated device,
said valve means including a movable selector element for selectively placing any one of said spaced exhaust openings in communication with said output port, thereby to apply a predetermined one of said different fluid pressures to said device.

4,540,027
CHECK VALVE FOR INFUSION AND TRANSFUSION APPARATUS

Hans J. Forberg, Damlos, Fed. Rep. of Germany, assignor to TRANSCODAN, Sven Husted-Andersen GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 533,000
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 8226183[U]
Int. Cl.³ F16L *11/00;* A61M *5/14*
U.S. Cl. 137—848 **5 Claims**



1. A check valve for infusion and transfusion apparatus, comprising a one piece hollow cylindrical member of elastic material defining a cylindrical hollow interior and having an open top end for the inflow of fluid and an opposite closed bottom portion, said bottom portion having a top surface in the hollow interior, said cylindrical member also having a side wall with cylindrical inner and outer surfaces and a planar incision extending into the hollow interior through the cylindrical inner and outer surfaces, up to a line which is tangent with the cylindrical inner surface, said incision providing a flow passage in a direction from the hollow interior outwardly, said planar incision lying in a plane closely adjacent and above the top surface of the bottom portion.

4,540,028

SHUTTLELESS WEAVING MACHINE WITH GRIPPER SYSTEMS FOR THE FILLING YARN INSERTION INTO AND RETRACTION FROM THE SHED

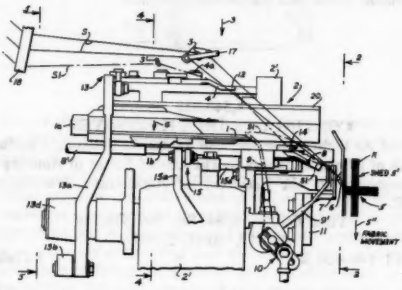
Fritz Gehring, Lindau-Bodolz, and Gerhard Hofmaier, Lindau-Oberreitnau, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Oct. 4, 1983, Ser. No. 538,955

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243628

Int. Cl.³ D03D *47/38*

U.S. Cl. 139—453 7 Claims



1. In a shuttleless weaving machine for weaving a fabric, including machine frame means, wherein a filling yarn is inserted by a gripper device advanced into and then retracted from a shed and including clamping means for the filling yarn, guide means (17) equipped with movable yarn guides (3) for presenting a particular selected filling yarn in a specific position to a filling yarn inserting gripping member of the gripper device, means (7) for cutting an inserted filling yarn from its associated supply spool between an interlacing point at the fabric and the path of the gripper device, a pivoting separating needle for inserting the selected filling yarn into a defined position between members of said cutting means, and a holding means (8) positioned between said cutting means and the path of the gripper device for holding the free end of the fed and cut filling yarn, the improvement comprising means (2') mounting said guide means (17) to said machine frame means so that each of said movable yarn guides in its operational position (3') is located at the same place, retraction means (4, 12, 13) operatively secured to said machine frame means and located substantially in an area between said movable yarn guides (3) and a path of said filling yarn inserting gripping member (1) of said gripper device (1) for retracting, by a distance, an end of a selected filling yarn (S1) from said holding means (8), and wherein said holding means (8) comprise yielding means for sufficiently yielding said selected filling yarn at least during a retraction by said retraction means for assuring uniformly short filling yarn ends.

4,540,029

WIRE COIL PRODUCTION SYSTEM

Peter Mihelich, Farmingdale, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 454,364, Dec. 29, 1982, abandoned. This application Nov. 28, 1984, Ser. No. 675,757

Int. Cl.³ B21F *3/04*

U.S. Cl. 140—92.2 6 Claims

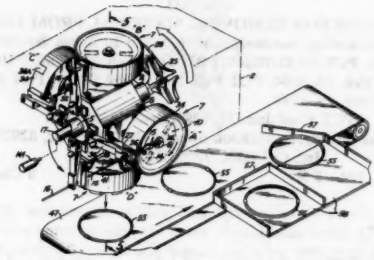
1. A wire coiling production system comprising:

(1) a set of rotatable mandrels, each having (a) wire sensing means, (b) means for engaging a pre-cut feed wire from a single source of wire, (c) means for constraining the wire in a coiled configuration as it is wound on said mandrels which are controlled by the beginning and end of each pre-cut feed wire fed into said system and (d) means for discharging the coil as a free-form coil after the winding operation is completed;

(2) controllable mandrel drive means for rotating each mandrel during certain phases of the coil-forming operation;

(3) feeding, winding and discharge stations;

(4) indexing means for moving each mandrel successively past the feeding, winding and discharge stations; and



(5) a control system for controlling the mandrel drive control, the indexing mechanism and the feeding, winding and discharge stations controlled by the leading and trailing ends of each pre-cut feed wire fed into said production system such that operations carried out at each station are coordinated to continuously, simultaneously and successively produce wound free-form coils.

4,540,030

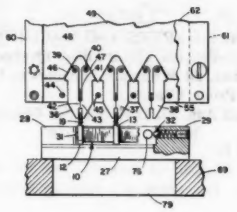
APPARATUS FOR COMPACTING LOOSE WRAPS OF WIRE ON TERMINALS

William C. Kent, Garland, Tex., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Mar. 27, 1984, Ser. No. 593,217

Int. Cl.³ H01F *41/10*; B21F *45/00*

U.S. Cl. 140—93 R 8 Claims



1. An apparatus for working on a first element coaxially positioned about a second element projecting from a work piece, which comprises:

a frame plate;

a fluid operated cylinder means having piston means for supporting said frame plate;

a pair of jaws pivotally mounted on said frame plate, said jaws having at least one abutment projecting from one inner jaw surface toward the other inner jaw surface;

resilient means for holding said jaws spaced apart to receive a second element projecting from the work piece;

a cam plate slideably mounted on said frame plate, said cam plate having camming surfaces shaped to engage outer surfaces of said jaws for closing said jaws against the action of said resilient holding means;

means for advancing a work piece to position the second element projecting from said work piece between said jaws;

means responsive to the positioning of the piece for sliding said cam plate to close said jaws about the second element; and

means operated subsequent to said sliding means for operating said fluid operated cylinder means to advance said piston means and frame plate to move said jaws along said second element to engage and work upon the first element.

4,540,031

MACHINE FOR REMOVING MATERIAL FROM LOGS

Roger Kvarnäng, Nordanågatan 18, S-820 10 Arbrå, Sweden

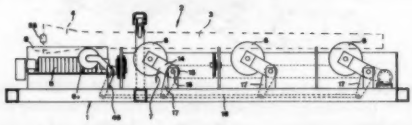
PCT No. PCT/SE83/00260, § 371 Date Feb. 13, 1984, § 102(e) Date Feb. 13, 1984, PCT Pub. No. WO84/00127, PCT Pub. Date Jan. 19, 1984

PCT Filed Jun. 23, 1983, Ser. No. 589,092

Claims priority, application Sweden, Jun. 24, 1982, 8203956

Int. Cl.³ B27C *1/00*; B27L *11/00*

U.S. Cl. 144—2 R **8 Claims**



1. A machine for removing swellings from an elongated log having opposite ends, said machine comprising:

a frame;

a holding device on said frame for holding and rotating said log with one of said ends of said log protruding from said holding device,

a rotatable milling unit on said frame having processing elements thereon for engaging and processing said one end of said log protruding from said holding device,

said holding device including bearing members supporting said log and being movable from an upper position wherein said log is located above and free from engagement with said milling unit to a lower position wherein said log is in contact with said milling unit.

4,540,032

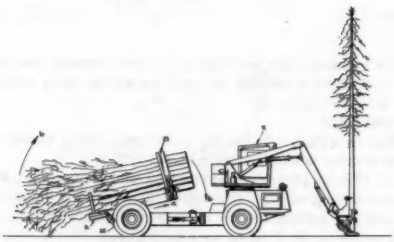
TREE HARVESTING MACHINE

Jean Pelletier, St-Felicien; Gilles Filion, Quebec, and Clement Potvin, St-Prime, all of Canada, assignors to Industries Tanguay Inc., St-Prime, Canada

Filed Aug. 10, 1984, Ser. No. 640,045

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—3 D **9 Claims**



1. A tree harvesting machine of the type having a wheel-mounted frame, a tree harvesting mechanism at the front end of said frame and berth means on said frame behind said harvesting mechanism for holding accumulated trees felled by said harvesting mechanism, lengthwise of said frame, the improvement wherein said berth means comprises:

a berth section and means mounting said berth section on said frame for pivotal movement about an axis transverse to said frame;

grapple means forwardly of said berth section, said grapple having a pair of gripping arms movable laterally of said frame and suitable to grip and tightly hold said accumulated felled trees together;

means interconnecting said grapple means and said berth section for slidable displacement of said grapple means with respect to said berth section and lengthwise of said frame between a position wherein said grapple means is close to said berth section and a position wherein said grapple means is away from said berth section, and

first power means interconnecting said berth section and said frame and suitable to pivot said berth section and grapple means about said transverse pivot axis.

4,540,033

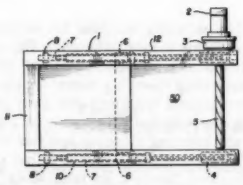
CONTINUOUS TREE HARVESTER

Michael A. Wehr, Hancock, and James A. Mattson, Laurium, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 14, 1984, Ser. No. 579,919

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—34 R **6 Claims**



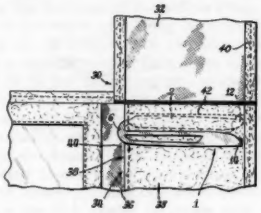
5. A tree harvester adapted to move forward over the ground at a preselected rate of speed, comprising support means and tree severing means, means to mount said tree severing means on said support means for relative motion of said tree severing means with respect to said support means, and said mounting means comprising means to permit said severing means to move with respect to said support means at a speed independent of the speed of motion of said support means moving at said preselected rate of speed;

said means to mount said severing means with respect to said support means comprising a movable frame member supporting said severing means and movable relative to said support means, said movable frame member being connected to said support means through bearing supports; said means to mount said severing means with respect to said support means further comprising cushion cylinder means to urge said severing means against a tree being cut, said cylinder means including piston means, said piston means being infinitely variably movable with respect to said cylinder means between a fully extended position and a fully retracted position, means to mount said severing means at the outer end of said piston means, means to position said piston means in said fully extended position with respect to said cylinder means prior to engagement of said severing means with a tree, whereby said piston means can move into said cylinder means under the control of the pressure in said cushion cylinder means as said harvester moves over the ground to permit said severing means to cut and advance into said tree in the forward direction at a speed controlled by the cutting action rather than at a speed controlled by the ground speed.

4,540,034
MONEY CLIP AND WALLET

Raymond W. Young, West Bend, Wis., assignor to Amity Leather Products Co., West Bend, Wis.

Filed May 9, 1984, Ser. No. 608,373
Int. Cl.[3] A45C 1/06; B42F 1/06
U.S. Cl. 150—137 4 Claims



1. In a wallet having a pocket formed from an inner wall with an interior and exterior surface and outer wall, a currency clip comprising:

a planar anchor arm for insertion into said pocket;

a planar gripping arm juxtaposed to and in the plane of said anchor arm and spaced therefrom throughout its length;

a flexure section at one end of said anchor arm and gripping arm arcuately connecting said anchor arm and said gripping arm defining an interior area between said arms permitting slidable insertion of said anchor arm into said pocket;

said anchor arm having an anchor surface,

said gripping arm having a gripping surface;

said anchor surface comprising an inside anchoring edge, an outside anchoring edge and an anchoring area therebetween;

said gripping surface comprising a gripping edge and a gripping area,

said anchoring arm and gripping arm resiliently moving from their coplanar position flexing around said flexure section upon insertion into said pocket to provide a resilient gripping deformation torque around an axis which is through said flexure section and which is perpendicular to said gripping and anchor arms and in a plane formed by the gripping and anchor arms, said inside anchoring edge frictionally engaging the interior surface of the inner wall,

said gripping edge frictionally engaging the exterior surface of the inner wall and surface of the currency therebetween when inserted therein,

said frictional engagement of the gripping edge and said anchoring edge increasing with increased flexural deformation torque created by the insertion of paper currency between said gripping surface and the exterior surface of the inner wall,

thereby securing said clip to said wallet and currency inserted between said exterior surface and said gripping surface.

4,540,035
TIRE REPAIR PATCH

Simon Roberts, 30543 Shoreham, Southfield, Mich. 48076

Filed Mar. 28, 1984, Ser. No. 594,174
Int. Cl.[3] B60C 21/02
U.S. Cl. 152—367 8 Claims

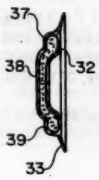
1. A patch for repairing and sealing a punctured vehicle tire comprising:

(a) a thick highly compliant annular sealing portion made from a soft rresilient air impervious closed cell elastomeric material, said annular sealing portion having parallel upper and lower annular faces, the lower of said faces being adapted to adhesively bond the annular sealing portion to the inner surface of a tire; and

(b) a thick cover portion adjoining the upper face of the annular sealing portion, said cover portion subtending a center aperture of the annular sealing portion and made integral with said annular sealing portion.

5. A patch for repairing and sealing a punctured tire comprising:

(a) a thick highly compliant annular sealing ring made from a soft resilient air impervious closed cell elastomeric material, said annular sealing ring having parallel upper and lower annular faces, the lower of said faces being adapted to adhesively bond said face to the inner surface of a tire; and

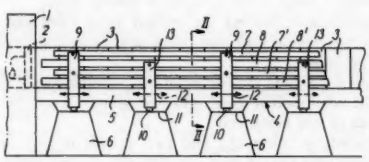


(b) a thin air impervious cover attached to the upper face of the sealing ring, said cover subtending the center aperture of the annular sealing ring.

4,540,036
CONVEYOR FOR THE STEPWISE ADVANCE OF A VERTICALLY PARTED BOXLESS MOULD THROUGH A POURING AND COOLING ZONE

Kaj J. Jensen, Lyngby, Denmark, assignor to Dansk Industri Syndikat A/S, Herlve, Denmark

Filed Jul. 5, 1983, Ser. No. 510,897
Claims priority, application Denmark, Jul. 15, 1982, 3180/82
Int. Cl.[3] B22C 9/20; B22D 5/04
U.S. Cl. 164—323 9 Claims



1. A conveyor for the stepwise advance of a vertically parted boxless mould through a pouring and cooling zone, comprising

a guideway having mould-carrying bottom rails and longitudinally movable side rails arranged on both sides of said guideway for advancing the mould stepwise while permanently squeezing the mould in its transverse direction, the side rails on each side of said guideway comprising at least two superposed lateral rods which are transversely movable inwardly for squeezing a mould in said guideway and moveable outwardly to ease said rod off a mould in said guideway, at least one of said rods on each side of said guideway being reciprocable in the longitudinal direction of the guideway, and each rod having a length sufficient to extend along a plurality of successive parts of the mould;

means for transversely moving each of said superposed rods inwardly and outwardly; and

means for controlling said rod moving means such that at least one superposed lateral rod on both sides of the guideway is not eased off a mould in said guideway until at least one other superposed lateral rod on both sides of said

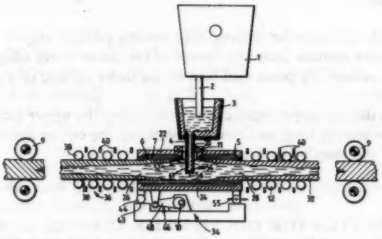
guideway is moved inwardly for squeezing a mould in said guideway whereby a mould in said guideway is held transversely compressed to approximately the same extent during the advancement of a mould along said guideway.

4,540,037

METHOD AND APPARATUS FOR BIDIRECTIONAL HORIZONTAL CONTINUOUS CASING

Carl Langner, Monsey, N.Y., assignor to Concast AG, Zurich, Switzerland

Filed Sep. 27, 1982, Ser. No. 425,120
Int. Cl.³ B22D *11/04, 11/10, 11/12, 27/02*
U.S. Cl. 164—466 **41 Claims**



1. A horizontal continuous casting method for bidirectionally casting strands comprising the steps of:

downwardly introducing molten metal through a mold inlet opening into a direct inflow region of a double-ended horizontal oscillating continuous casting mold;

preventing the formation of a strand shell along walls of the continuous casting mold at said direct inflow region of the molten metal in the continuous casting mold;

bidirectionally feeding the molten metal from said direct inflow region into two oppositely extending cavities of said mold;

cooling the infed molten metal and simultaneously forming the infed molten metal into two strands in said two cavities of said mold; and

horizontally conveying said two strands in two opposite directions out of said continuously casting mold while oscillating said continuous casting mold.

24. A continuous casting apparatus for bidirectionally casting strands, comprising:

a substantially straight horizontal continuous casting mold having a mold inlet opening for receiving molten metal and two opposite hand cavities within which there are simultaneously formed two strands;

an electromagnetic coil for generating a magnetic field acting upon a liquid metal meniscus in the continuous casting mold at the region of the mold inlet opening for counteracting the metallostatic pressure within the continuous casting mold;

a pouring tube for infeeding the molten metal through the mold inlet opening and coacting with the mold cavities in a manner such as to create a common imaginary hot wall conjointly effective at an interface region between both of the continuously cast strands formed in the continuous casting mold in order to preclude the formation of a strand shell at said interface region so as to facilitate withdrawal of both strands independently of one another from the continuous casting mold; and

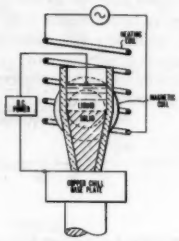
means for substantially horizontally oscillating said continuous casting mold.

4,540,038

METHOD FOR PRODUCTION OF COMBUSTION TURBINE BLADE HAVING A HYBRID STRUCTURE

Michael A. Burke, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 5, 1984, Ser. No. 617,458
Int. Cl.³ B22D *11/16*
U.S. Cl. 164—499 **1 Claim**



1. In a process of fabricating directionally solidified turbine blades for combustion turbines of the type wherein a mold containing molten metal is cooled in a controlled fashion such that solidification occurs slow enough to allow directional solidification beginning at the airfoil end, the improvement comprising:

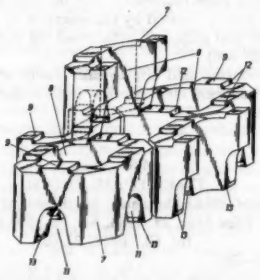
monitoring said solidification and starting magnetic mixing of the remaining molten metal at approximately the beginning of solidification of said root section and then increasing the rate of cooling of said blade to a rate faster than at which directional solidification occurs, whereby a blade is produced with a directionally solidified airfoil section and a fine grained root section and without a substantially inhomogeneous portion at the interface between the airfoil and root sections.

4,540,039

PRISMATIC REFRACTORY BRICK FOR GLASS MELTING FURNACE CHAMBERS

Otto Karl, Vienna, Austria, assignor to Veitscher Magnesitwerke-actien-Gesellschaft, Vienna, Austria

Filed May 2, 1983, Ser. No. 490,719
Claims priority, application Austria, May 3, 1982, 1723/82
Int. Cl.³ F28D *17/02*
U.S. Cl. 165—9.4 **5 Claims**



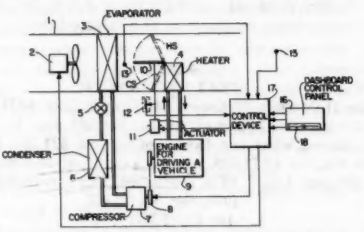
1. In a checker work in chambers of a glass melting furnace, wherein the checker work is a stack of layers of prismatic bricks of refractory material, the bricks in superposed ones of the layers being staggered relative to each other: each prismatic brick having an octagonal bottom surface, an octagonal top surface, a longitudinal axis extending between the surfaces, a single through passage of tetragonal cross section between

the surfaces and coaxial with the longitudinal axis, inner walls defining the through passage, outer walls between the surfaces, the walls being parallel to the longitudinal axis, the bottom and top surfaces extending along major axes, the through passage having a hydraulic diameter of 120 to 200 mm, the hydraulic diameter being defined by the relationship: four times the through passage cross section divided by the periphery of the through passage cross section, and the ratio of the hydraulic diameter to the thickness of the hollow brick, measured in the direction of the major axes being between 3 and 5, recessed passages in the bottom surface extending from the through passage to a respective one of the outer walls, the product of the length of the line delimiting each recessed passage and the distance between the inner and outer walls being at least equal to the area of the recessed passage, the top surface having elevated portions extending perpendicularly to the major axes and having beveled end faces, and the bottom surface having corresponding depressed portions defined by bottom ends of the recessed passages having congruent beveled end faces and extending in the direction of the major axes.

4,540,040
AIR TEMPERATURE CONTROL SYSTEM FOR VEHICLES

Ryutaro Fukumoto; Shuji Oyagi; Yukio Yoshida, and Ryosaku Akimoto, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1982, Ser. No. 446,215
Claims priority, application Japan, Dec. 23, 1981, 56-208284
Int. Cl.³ F25B *1/00, 29/00;* **B60H** *3/00;* **B61D** *27/00*
U.S. Cl. 165—12 **10 Claims**



1. An air temperature control system for regulating the air temperature in a room in a vehicle, comprising:

a. means, defining a continuous path, for directing air along said path into said room;

b. means, disposed in said path, for respectively cooling and not cooling said air in said path, in response to ON signals and OFF signals; said cooling means having a duty cycle defined by the proportion of time said cooling means is operating and not operating;

c. means, disposed in said path, for adding heat to the air cooled in said cooling means;

d. means for producing a difference signal indicative of the difference between the temperature of the air in the room and a preset temperature value; and

e. feedback control means, responsive to said difference signal, for regulating the rate of adding heat by said adding heat means, and regulating the duty cycle of said cooling means, so as to continuously reduce the difference between the temperature of the room air and the preset temperature value; said feedback control means including:

(1) means, responsive to said difference signal, for incrementally changing the heating rate of adding heat by said adding heat means;

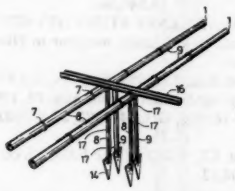
(2) means, responsive to said signal, for adjusting said duty cycle to reduce said temperature difference, when said heating rate is less than a predetermined low heating amount; and

(3) heating rate decreasing means for incrementally decreasing said heating rate to below said predetermined low heating amount; said heating rate decreasing means including means for incrementally reducing said duty cycle when said heating rate is above said predetermined low heating amount so as to increase said temperature difference, thereby to cause said incrementally changing means to decrease said heating rate toward said predetermined low heating amount.—

4,540,041
ARRANGEMENT FOR TUBULAR HEAT EXCHANGERS LOCATED IN A LAKE

Lennart Backlund, Frösön, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Apr. 22, 1983, Ser. No. 487,872
Claims priority, application Sweden, Apr. 23, 1982, 8202548
Int. Cl.³ F28D *7/00*
U.S. Cl. 165—45 **3 Claims**



1. Heat exchange apparatus adapted to be anchored to the bottom of a lake, said heat exchange apparatus comprising a heat exchanger means adapted to circulate a heat exchanger medium for absorbing heat from a lake, a first end of a plurality of heat pipes are connected in a heat transfer relation with said heat exchanger means, said plurality of heat pipes being sealed at both ends and each forming a closed housing for a refrigerant, means for anchoring said heat exchanger means adapted to anchor said heat exchanger means to the bottom of the lake, said means for anchoring comprises a plate and a second end of said plurality of heat pipes adapted to be buried in the bottom of the lake in heat transfer contact with the bottom of the lake, and when said second end of said plurality of heat pipes is buried in heat transfer contact with the bottom of the lake, heat is transferred from the bottom of the lake to the refrigerant and from the refrigerant to the heat exchanger means connected in said heat transfer relation with said first end of said plurality of heat pipes, the second end of said plurality of heat pipes thereby becoming solidly frozen in place as a result of heat being transferred from the bottom of the lake and forming ice at the bottom of the lake, so that the heat exchanger means becomes anchored to the bottom of the lake.

4,540,042
INCLINED THERMAL TRANSFER ENHANCEMENT SYSTEM

Thomas T. Zelek, 4 Madsen Rd., West Hartford, Conn. 06110, and John C. Ellsworth, 737 Arch St., New Britain, Conn. 06051

Filed Oct. 30, 1981, Ser. No. 316,955
Int. Cl.³ F28D *15/00;* **F28F** *13/00*
U.S. Cl. 165—96 **10 Claims**

1. A heat transfer module, which comprises:

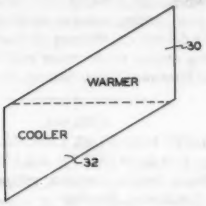
an envelope having a cross-section which has generally opposed first and second surfaces, said first surface being disposed at a higher elevation than said second surface;

a fluid disposed in said envelope which substantially fills said envelope, all of said fluid being substantially in the same physical state;

means for exchanging heat with said first surface and means for exchanging heat with said second surface;

said module having first and second opposed faces, said first surface including at least a part of said first face and said

second surface including at least a part of said second face; and



means for mounting said module for reversal of said first and second surfaces.

4,540,043

HEAT-GENERATING DEVICE

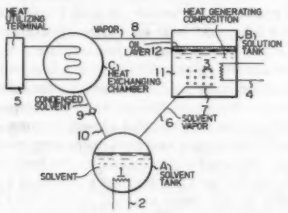
Mitsuyoshi Miura, Itako, Japan, assignor to Hirohiko Yasuda, Saitama, Japan

Filed Aug. 23, 1983, Ser. No. 525,671

Claims priority, application Japan, Aug. 23, 1982, 57-144675; Sep. 25, 1982, 57-166056; Oct. 14, 1982, 57-179032; Jun. 3, 1983, 58-97934

Int. Cl.[3] **F28D** *21/00;* **F25B** *15/00*

U.S. Cl. 165—104.12 **6 Claims**



1. A heat-generating device comprising a solution tank containing a heat-generating composition composed of a solution capable of generating the heat of absorption when absorbing a solvent vapor and an oil having a lower specific gravity than said solution, a solvent tank for supplying the solvent to the solution tank via nozzle means, heating means for heating said solvent and said heat-generating composition, and a heat-exchanging chamber disposed between the vapor phase of the solution tank and the solvent tank, connection means between said heat-exchanging chamber and said solvent tank for fluidly connecting said heat-exchanging chamber and said solvent tank, said connection means including one-way valve means allowing fluid flow only from said heat exchanging chamber to said solvent tank, and means connected in heat exchange relation with said heat-exchanging chamber and receiving heat therefrom.

4,540,044

RADIATOR ARRANGEMENT

Werner Lenz, Muehlacker, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,640

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1983, 3303986

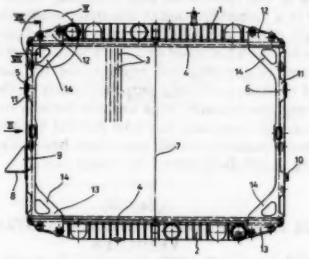
Int. Cl.[3] **F28D** *1/00*

U.S. Cl. 165—149 **16 Claims**

1. A radiator arrangement for water cooled combustion engines, especially for commercial vehicles having an upper and lower water box and a cooling block, wherein said cooling block includes a plurality of tubes for communicating fluid flow between said upper and lower water boxes, the improvement comprising:

said upper and lower water boxes being formed of a plastic material having cylindrical bores therethrough at each corner of said water boxes;

a pair of lateral support parts for fixedly attaching said upper and lower water boxes to the respective upper and lower portions of said cooling block, said lateral support parts including fastening flanges at the end of each lateral support part for laterally strapping to said upper and lower water boxes, said fastening means having like bores which



align with said bores of upper and lower water boxes for providing a cylindrically continuous opening through which a smooth aligning pin can extend therethrough, thereby connecting said lateral support parts with said water boxes so that the combination thereof holds said cooler block between them, said lateral support parts further including a vehicle frame means for connecting said radiator arrangement to a vehicle frame.

4,540,045

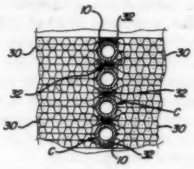
HEAT EXCHANGER

Victor D. Molitor, 90 Corona St., Denver, Colo. 80218

Continuation-in-part of Ser. No. 836,085, Sep. 23, 1977, abandoned, which is a division of Ser. No. 621,284, Oct. 10, 1975, Pat. No. 4,071,935, which is a continuation-in-part of Ser. No. 602,685, Aug. 7, 1975, abandoned. This application Feb. 12, 1979, Ser. No. 11,402

Int. Cl.[3] **F28D** *7/02*

U.S. Cl. 165—164 **15 Claims**



1. A heat exchanger comprising:

a hollow coil including a series of connected turns in a generally parallel spiral relation and through which a liquid is to be passed for heat transfer;

a multi-layer assembly of members disposed between substantially each adjacent pair of turns, with each member extending generally parallel to the plane of the respective coil turns and across the central space within said turns;

said members having apertures for the flow of a fluid therethrough, having means providing elongated heat conducting paths across said members and made of a material permitting said members to be deformed against each other and said turns;

said members being compressed against each other and portions of said members being compressed between and deformed against adjacent turns of said coil;

means laterally enclosing said coil and members; and

substantially non-deformable perforate means engaging the member at each end of said coil for restraining said mem-

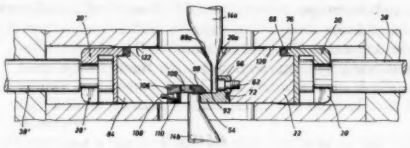
bers to maintain the deformed and compressed condition thereof and the compression contact of said deformed portions of said members with the coil turns to permit conduction of heat along said members between the turns and the space encompassed by the coil turns, whereby a fluid for heat transfer may flow through said members in a direction transverse to the plane of the respective coil turns.

4,540,046

SHEAR RAM APPARATUS

Stanley W. Granger, Diamond Bar, and James J. Camerano, Rowland Heights, both of Calif., assignors to NL Industries, Inc., New York, N.Y.

Filed Sep. 13, 1983, Ser. No. 531,928
Int. Cl.³ E21B *29/00*
U.S. Cl. 166—55 **42 Claims**



1. Shear ram apparatus for severing and sealing a string of drill pipe comprising:

a housing body having a throughway for receipt of said drill pipe;

and opposed first and second ram assemblies mounted in said housing body on opposite sides of said throughway for reciprocation laterally inwardly and outwardly, each of said ram assemblies comprising a carrier connected to a drive means for effecting such reciprocation, and a ram block carried on the laterally inward side of said carrier, the maximum thickness of said block being generally equal to the maximum thickness of said carrier measured generally longitudinally of said throughway;

said first ram assembly further comprising a blade member carried on its ram block;

said second ram assembly having, on its ram block, an anvil formation positioned for cooperation with said blade member to apply a shearing force to said drill pipe when said ram assemblies are moved laterally jnwardly;

in said second ram assembly, said ram block being connected to said carrier for limited relative lateral movement such that, upon movement of said second ram assembly laterally inwardly, and further upon arresting of such laterally inward movement of said ram block, said carrier may continue such laterally inward movement for a limited distance;

said second ram assembly further comprising second seal means cooperative between said ram block and said carrier for compressive actuation by such continued laterally inward movement of said carrier with respect to said ram block;

said ram block of said second ram assembly defining a recess opening laterally inwardly toward said throughway for receipt of said blade member when said ram assemblies are moved laterally inwardly;

said second seal means comprising a blade sealing element facing longitudinally into said recess for sealing against a longitudinally facing surface of said blade member;

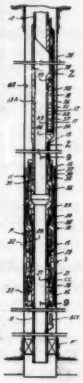
and said second ram assembly further comprising a seal actuator element disposed in laterally outward backing relation to said blade sealing element and in lateral alignment with said ram block generally within the longitudinal extremities of said maximum thickness, said actuator element being mounted on said ram block for limited lateral movement with respect to said ram block, and said carrier of said second ram assembly being in laterally outward backing relation to said actuator element, whereby, upon such continued laterally inward movement of said carrier with respect to said ram block, said actuator element is moved laterally inwardly with respect to said blade sealing element.

4,540,047

FLOW CONTROLLING APPARATUS

Neil H. Akkerman, Kingwood, Tex., assignor to AVA International Corporation, Houston, Tex.

Continuation of Ser. No. 233,628, Feb. 17, 1981, abandoned. This application Jul. 14, 1983, Ser. No. 513,392
Int. Cl.³ E21B *23/03, 33/12, 34/10, 34/16*
U.S. Cl. 166—188 **56 Claims**



1. Apparatus for controlling flow within the annulus about a tubing string suspended within a well bore, comprising body means having a bore therethrough adapted to be connected as port of the tubing string and a pocket to one side of the bore having an end opening to said bore, a packer for sealing between the body means and the well bore, means which bypasses the packer for connecting the annulus above and below the packer, valve means for opening and closing a flow path through said connecting means, fluid responsive means for moving said valve means from normally closed to open position, said moving means being carried within a tool which is adapted to be moved vertically through the tubing string into and out of landed position within the pocket, and means through which control fluid may be supplied through a line leading from a remote source to said fluid responsive means, when said tool is so landed, in order to open said valve means.

4,540,048

LOCKING DEVICE FOR WELL TOOLS

Imre I. Gazda, Fort Worth, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 27, 1984, Ser. No. 604,384
Int. Cl.³ E21B *23/00*
U.S. Cl. 166—214 **13 Claims**

1. A device for releasably locking a well tool in a receptacle in a well conduit, said receptacle having a pair of oppositely facing abrupt shoulders therein, said device comprising:

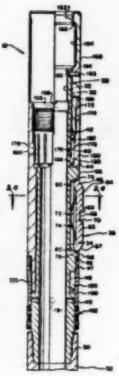
a. tubular mandrel means having means on the lower end thereof for attachment of a well tool;

b. locking keys carried on said mandrel means, said locking keys having a pair of oppositely facing abrupt shoulders engageable with said oppositely facing abrupt shoulders of said receptacle;

c. means biasing said keys outwardly toward a position of engagement with said abrupt shoulders of said receptacle;

d. key retraction means carried on said mandrel means and being movable longitudinally relative thereto between upper and lower positions, said retraction means having

camming surfaces thereon engageable with corresponding camming surfaces on said locking keys for moving said keys to retracted position responsive to upward movement of said retraction means relative to said mandrel means; and



e. resilient seal means on said mandrel means sealing between said mandrel means and said landing recep- tacle.

4,540,049

METHOD OF IMPROVING STEAM FLOOD CONFORMANCE WITH STEAM FLOODING AGENTS WITHOUT A NON-CONDENSABLE GAS

Jeffrey T. Hawkins, and Zean Z. Gassmann, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 576,692, Feb. 3, 1984, abandoned. This application Aug. 8, 1984, Ser. No. 638,918

Int. Cl.[3] E21B *43/22, 43/24*

U.S. Cl. 166—272 10 Claims

1. A process for recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well, which comprises:

injecting steam into an injection well;

injecting into the injection well a mixture of steam and about 0.01% to about 5% by weight of a foaming agent based upon the weight of the steam in the injected mixture,

said foaming agent represented by the formula,

$$RO(R'O)_nR''SO_3^-M^+,$$

where R is an alkyl radical, branched or linear, having from about 15 to about 21 carbon atoms in the alkyl chain, R' is ethyl or propyl, n has an average value of about 2 to about 5, R'' is ethyl, propyl, hydroxypropyl or butyl, and M^+ is an alkali metal or ammonium ion;

injecting steam into said injection well; and

recovering hydrocarbons and other fluids at a production well.

4,540,050

METHOD OF IMPROVING CONFORMANCE IN STEAM FLOODS WITH STEAM FOAMING AGENTS

Wann-Sheng Huang; Zean Z. Gassmann; Jeffrey T. Hawkins; Vernon H. Schievelbein, all of Houston, and Wilbur L. Hall, Bellaire, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 576,693, Feb. 3, 1984, abandoned. This application Aug. 8, 1984, Ser. No. 638,919

Int. Cl.[3] E21B *43/22, 43/24*

U.S. Cl. 166—272 13 Claims

1. A process for recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well producing a water cut of at 90%, which comprises:

injecting steam into an injection well;

injecting into the injection well a mixture of steam, about 0.01 to about 5 thousand standard cubic feet of a non-condensable gas per barrel of steam in the injected mixture and about 0.01% to about 5% by weight of a foaming agent based upon the weight of the steam in the injected mixture,

said foaming agent represented by the formula,

$$RO(R'O)_nR''SO_3^-M^+,$$

where R is an alkyl radical, branched or linear, or an alkylbenzene, alkyltoluene or alkylxylene group having from about 8 to about 24 carbon atoms in the alkyl chain, R' is ethyl, propyl or a mixture of ethyl and propyl, n has an average value of about 1 to about 20, R'' is ethyl, propyl, hydroxypropyl or butyl, and M^+ is an alkali metal or ammonium ion;

injecting steam into said injection well; and

recovering hydrocarbons and other fluids from a well.

4,540,051

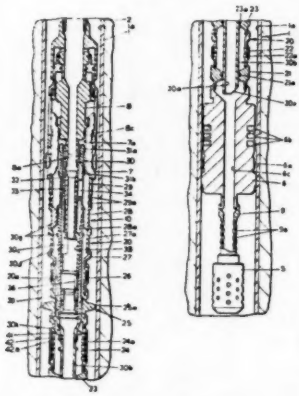
ONE TRIP PERFORATING AND GRAVEL PACK SYSTEM

Phillip W. Schmuck, Spring; John V. Salerni, Kingwood, and Rodney J. Wetzel, Woodlands, all of Tex., assignors to Baker International Corporation, Orange, Calif.

Continuation of Ser. No. 501,262, Jun. 6, 1983, which is a continuation of Ser. No. 250,772, Apr. 3, 1981, abandoned. This application Jan. 17, 1985, Ser. No. 692,337

Int. Cl.[3] E21B *43/04, 43/10*

U.S. Cl. 166—278 3 Claims



1. The method of perforating and gravel packing the production zone of a subterranean well with one trip of a work string comprising the steps of:

(1) assembling at the surface for attachment to the end of a tubular work string a hollow liner assembly including a production screen, a first settable and releasable packer secured to the lower end of the hollow liner assembly, a hydraulically settable packer secured to the upper end of the hollow liner assembly, a perforating mechanism supported below the lower packer by a length of tubing, a pressure operated actuator releasably connected to the first packer, and a hollow crossover mandrel assembly connected to the actuator and insertable within the liner assembly and defining a horizontal annular ball seat intermediate said first and second packers;

(2) lowering the work string with the above listed assemblies

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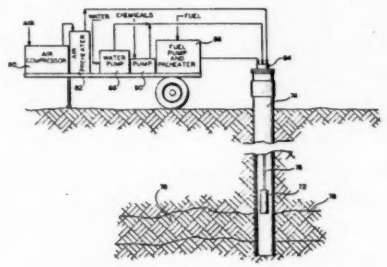
thereon into the well until the perforating mechanism is positioned adjacent to the desired production zone;
(3) setting the first packer in a position immediately above the desired production formation with said perforating mechanism adjacent the desired production zone;
(4) inserting a perforation activating element through the hollow work string and the bore of the hollow mandrel assembly, the second packer, and the tubing supporting the perforating mechanism to discharge the perforating mechanism and perforate the casing;
(5) releasing said first packer and lowering the work string to position said first packer below the perforated production zone, and then resetting said first packer;
(6) dropping a ball through the work string to seat on said annular ball valve seat in the hollow crossover mandrel assembly thereby permitting fluid pressure to be built up within the work string;
(7) increasing the fluid pressure in the work string to a level sufficient to cause the actuator to set said second packer;
(8) increasing the fluid pressure in the work string to a level sufficient to cause the downward displacement of the valve seat element of said hollow crossover mandrel assembly and open a radial fluid passage from the bore of said hollow crossover mandrel to the bore of said liner assembly;
(9) releasing a flapper valve to close the bore of the hollow crossover mandrel assembly by the downward movement of the ball seat sleeve; and
(10) introducing gravel carrying fluid through the work string to flow through said radial passage and passages defined by the hollow crossover mandrel and the hollow liner assembly downwardly along the casing annulus between said first and second packers, through the production screen, and upwardly through the crossover assemblage to the casing annulus at a point above said second packer.

4,540,052

GENERATION OF MICROORGANISM CONTROL COMPOSITION AND USE THEREOF

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 363,738, Mar. 30, 1982, abandoned. This application Jun. 21, 1983, Ser. No. 506,187
Int. Cl.³ E21B *43/20, 43/24;* C02F *1/50;* C01B *15/024*
U.S. Cl. 166—303 **38 Claims**



21. A method of treating a body of fluid containing microorganisms to control said microorganisms comprising:
(a) burning a hydrogen-containing fuel within a reactor in the presence of an oxidizing agent under conditions sufficient to produce partial oxidation products containing significant amounts of at least one compound capable of controlling microorganisms;
(b) abruptly terminating said burning to prevent significant decomposition of the thus produced partial oxidation products and the formation of products of complete combustion therefrom, by, at least in part, introducing a quench fluid into said partial oxidation products within said reactor to produce an effluent containing said partial oxidation products; and
(c) contacting said body of fluid with said effluent containing said partial oxidation products.

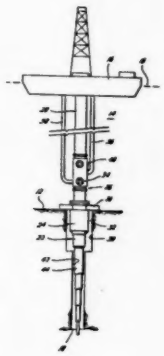
31. A method of displacing oil from a subsurface earth formation, penetrated by at least one borehole, with a body of aqueous fluid containing microorganisms and to simultaneously control said microorganisms comprising:
(a) burning a hydrogen-containing fuel within a reactor under conditions sufficient to produce an effluent including partial oxidation products containing significant amounts of at least one compound capable of controlling microorganisms;
(b) abruptly terminating said burning to prevent significant decomposition of the thus produced partial oxidation products and the formation of other products therefrom, by, at least in part, introducing a quench fluid into said flame front within said reactor to produce an effluent containing said partial oxidation products;
(c) treating said body of aqueous fluid by one of (1) mixing said effluent containing partial oxidation products and at least part of said body of aqueous fluid at the surface of the earth, (2) mixing said effluent containing partial oxidation products and at least part of said body of aqueous fluid in the top of said borehole, (3) mixing said effluent containing partial oxidation products and at least part of said body of aqueous fluid in said borehole adjacent said subsurface earth formation and (4) introducing at least part of said body of aqueous fluid into said flame front as at least part of said quench fluid to produce a mixture of all of said effluent containing partial oxidation products and said body of aqueous fluid within said subsurface earth formation; and
(d) displacing the thus produced mixture of said effluent including partial oxidation products and said aqueous fluid through said subsurface earth formation.

4,540,053

BREECH BLOCK HANGER SUPPORT WELL COMPLETION METHOD

Benton F. Baugh; Herman O. Henderson, Jr., both of Houston, and John H. Fowler, Spring, all of Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 350,374, Feb. 19, 1982,. This application Dec. 6, 1983, Ser. No. 546,531
Int. Cl.³ E21B *43/013*
U.S. Cl. 166—348 **10 Claims**



1. A method for completing an underwater well having a weak formation extending below the conductor casing, which formation cannot otherwise withstand the pressure of the

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drilling mud required to contain the downhole pressure of the well, comprising the steps of:

(a) locating drilling means at an underwater well site above the weak formation;

(b) installing conductor casing in the floor of a body of water with a wellhead, blowout preventer stack, and riser attached thereto at a point near the floor, the riser extending upwardly to the drilling means;

(c) running a drill string and standard drill bit through the wellhead and conductor casing;

(d) drilling a hole for suspending an intermediate-sized formation support casing within said wellhead and conductor casing;

(e) lowering a hanger-support member having the intermediate-sized formation support casing string attached thereto into the well until the hanger-support member lands in the wellhead, said intermediate-sized formation support casing string extending below the conductor casing and through the weak formation;

(f) rotating the hanger-support member less than 360° to connect the hanger-support member within the wellhead;

(g) latching the hanger-support member within the wellhead;

(h) drilling a hole for suspending the outermost surface casing within the wellhead and conductor casing and the intermediate-sized formation support casing;

(i) running a casing hanger with such outermost surface casing string attached thereto through the riser and into the wellhead; and

(j) landing the casing hanger with such outermost surface casing string attached thereto on the hanger-support member.

4,540,054

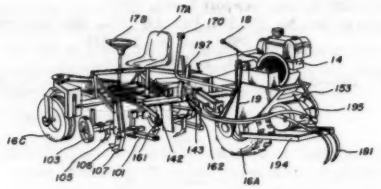
CULTIVATING ATTACHMENT FOR CROP HARVESTER SUPPORT VEHICLE

Larry D. Swetnam; James H. Casada, and Linus R. Walton, all of Lexington, Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Continuation-in-part of Ser. No. 408,232, Aug. 16, 1982, Pat. No. 4,470,242. This application May 19, 1983, Ser. No. 496,306

Int. Cl.³ A01B *49/00, 63/104*

U.S. Cl. 172—292 **6 Claims**



1. A cultivator for attachment to a motorized crop harvester support vehicle including a pair of longitudinal support frame members, spaced transverse frame members, and at least one steerable wheel comprising:

a pair of tool frame members;

soil tilling tools adjustably mounted relative to said tool frame members;

a first transverse shaft rotatably mounted on the support frame members of the crop harvester support vehicle;

actuating means operatively connected to said first shaft and said support tool frames for selectively imparting rotation to said shaft;

a substantially parallel linkage operatively, pivotally connected between said tool frame member and one of said transverse support frame members for guiding said tool frame members and soil tilling tools between a raised position out of engagement with a ground surface and a lowered position into engagement with the ground surface;

connecting means operatively connected to said shaft and said tool frame members for translating rotational motion of said first frames into rotatable, vertical motion of said tool frame members and said soil tilling tools about said linkage pivotally mounted to said support frame to selectively raise and lower said tool frame members and said soil tilling tools;

a ground engaging wheel adjustable mounted relative to each of said tool frame members for regulating the depth of penetration of said soil tilling tools;

a second shaft forwardly mounted on said support frame; and

a spring toothed scratcher behind said at least one steerable wheel connected to an arm secured to said second shaft, a connecting linkage being operatively connected between said first shaft and said second shaft for imparting rotational motion to said second shaft upon rotation of said first shaft for selectively raising and lowering said spring toothed scratcher in unison with said tool frame members and soil tilling tools.

4,540,055

DRILL BIT ASSEMBLY HAVING IMPROVED OPERATIONAL LIFE

Donald D. Drummond, Jasper; Walter F. Johnsey, and Roy W. Wood, both of Birmingham, all of Ala., assignors to Drumco, Jasper, Ala.

Filed Jun. 10, 1983, Ser. No. 503,265

Int. Cl.³ E21B *17/22*

U.S. Cl. 175—323 **9 Claims**

1. A drill bit assembly for attachment to a rotary drill for drilling into a hard material, the assembly comprising:

an elongated housing having a drill end adapted for attachment to extension means driven by a rotary drill and a tool end for receiving a bit having at least one cutting cone for engaging and cutting a drill hole into the material to be drilled;

a plenum chamber within the housing for receiving pressurized gaseous fluid from a fluid source;

pressure-reducing means comprising a flow restricting orifice in the plenum chamber to provide a reduced pressure and reduced quantity of flow;

first conduit means communicating with said flow restricting orifice for receiving the reduced flow from the pressure-reducing means and for directing the reduced flow from the plenum chamber out of the housing adjacent the at least one cutting cone and into impingement upon material being drilled to pick up and remove along the housing dust and cuttings from the vicinity of the cutting cone;

flow redirecting means comprising wall means extending less than the full circumference of the housing and supported on the outer surface of the housing for diverting the reduced gaseous fluid flow and the entrained dust and cuttings into a generally helical path around the housing;

second conduit means comprising at least one passage through the wall of the housing above the orifice and having a nozzle outlet positioned for discharging a second flow of gaseous fluid out of the plenum chamber away from the cutting cone and into the helical path; and

the relative sizes of the flow restricting orifice and the nozzle outlet being such that the first gaseous fluid flow is sufficient in quantity and velocity for conveying the dust and cuttings from the vicinity of the cutting cone and into the second gaseous fluid flow of a high velocity from the nozzle outlet and of a quantity sufficient to combine with the first flow for conveying the dust and cuttings away from the bit assembly and out of the drill hole, the fluid flows being directed as necessary in movement by the flow redirecting means into the generally helical path.

4,540,056

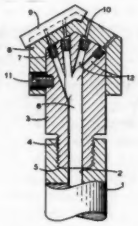
CUTTER ASSEMBLY

Thomas A. O'Hanlon, Tacoma, Wash., assignor to Inco Limited; Falconbridge Limited; Noranda, Inc.; Kidd Creek Mines Limited, all of Toronto, Canada and Flow Industries, Inc., Kent, Wash.

Filed May 3, 1984, Ser. No. 607,017

Int. Cl.³ E21B *10/62, 10/64*

U.S. Cl. 175—393 **4 Claims**



1. A high pressure, non-percussive fluid jet cutting drill bit, the bit comprising a housing, the housing including a cylindrical body having a peaked proximal section and a distal section adapted to threadingly engage a drill rod, a fluid passage extending through the body, a plurality of branches communicating with the fluid passage and extending without the peaked proximal section, a complimentary cup-like cutter assembly demountably enveloping the peaked proximal section and extending towards the distal section, the cup-like cutter assembly having a peaked work face and a plurality of apertures, a plurality of nozzles disposed in the branches and adjacent to the apertures, the common contacting surfaces of the cup-like cutter assembly and cylindrical body in tight non-threaded registry, a cutter affixed to the cup-like cutter assembly, and a securing member extending through the side of the cup-like cutter assembly and into the side of the housing so as to secure the cup-like cutter assembly to the housing and to maintain a concentric alignment of passage, nozzle and aperture.

4,540,057

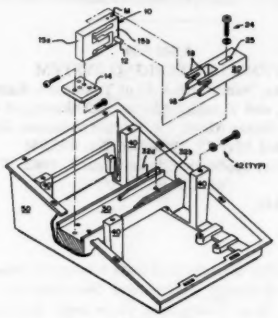
ADJUSTABLE INCLINED PLANE DOWNSTOP FOR A LOAD CELL

Gerald C. Freeman, Darien, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 7, 1984, Ser. No. 618,277

Int. Cl.³ G01G *23/02, 21/28*

U.S. Cl. 177—154 **9 Claims**



1. An apparatus for protecting a load cell from overloads and shock loads, comprising:

(a) an element movable in a direction substantially normal to the direction in which said load cell deflects under load and fixed in such deflection direction and having an inclined projection projecting under said load cell so that a clearance exists between said load cell and said inclined projection under no load conditions, said clearance being essentially equal to the deflection of said load cell under a predetermined load, whereby under loads at least equal to said predetermined load said load cell bears on said incline projection so as to prevent further deflection of said load cell; and,

(b) means for securing the position of said movable elelment with respect to said load cell so as to maintain said clearance.

4,540,058

APPARATUS FOR WEIGHING HEAVY LOADS

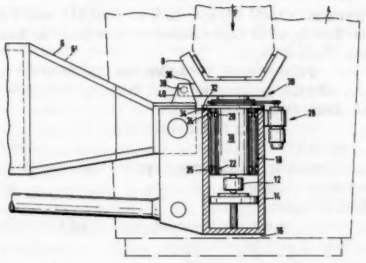
André Kremer, and Marcel Wolwert, both of Luxembourg, Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Mar. 23, 1984, Ser. No. 592,791

Claims priority, application Luxembourg, Mar. 23, 1983, 84710

Int. Cl.³ G01G *21/02, 21/12*

U.S. Cl. 177—255 **15 Claims**



1. A weighing apparatus for heavy loads comprising:

a vertical cylindrical column having a first end, said first end being provided with mounting support means for supporting the load to be weighed;

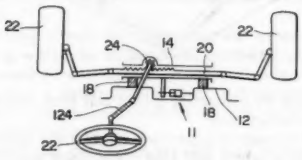
guide tube means coaxial with said column;
rotatable sleeve means being positioned between said guide tube means and said column;
first bearing means being disposed between said column and said sleeve means;
second bearing means being disposed between said sleeve means and said guide tube means; and
weighing means, said weighing means disposed beneath a second end of said cylindrical column.

4,540,059

VEHICLE STEERING SYSTEM

Yasuji Shibahata; Namio Irie, both of Yokohama; Kazuo Ikawa, Tokorozawa, and Yohsuke Akatsu, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 19, 1983, Ser. No. 495,948
Claims priority, application Japan, Jun. 7, 1982, 57-97368
Int. Cl.[3] B62D *5/06*
U.S. Cl. 180—141 **6 Claims**



1. In an automotive vehicle, a steering system comprising;
a housing supported on a chassis of said vehicle by an elastomeric member;
a rack slidably disposed in said housing;
a pinion disposed in said housing, said pinion being arranged to mesh with said rack;
a steering wheel operatively connected with said pinion for synchronous rotation therewith;
a source of hydraulic fluid under pressure;
a hydraulic servo fluidly connected with said source and operatively connected with said housing for selectively biasing same in first and second axial directions;
a control valve fluidly interposed between said servo and said source for selectively pressurizing said servo in a manner to bias said housing in said first and second axial directions; and
control means operatively connected with said control valve for controlling said control valve in response to a sensed vehicle operating parameter.

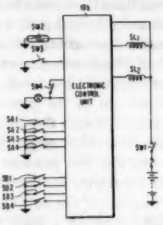
4,540,060

AUTOMOBILE SPEED CONTROL SYSTEM

Shoji Kawata; Hitoshi Hyodo, both of Okazaki, and Tokihiko Akita, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 1, 1984, Ser. No. 585,044
Claims priority, application Japan, Mar. 1, 1983, 58-034268; Mar. 15, 1983, 58-042828
Int. Cl.[3] B60K *31/00*
U.S. Cl. 180—179 **21 Claims**

1. An automobile speed control system for use with an automobile, comprising:
(a) a throttle valve;
(b) actuator means operatively connected to said throttle valve for actuating said throttle valve;
(c) a plurality of switch means;
(d) detector means for detecting a speed of the automobile;
(e) a plurality of automobile speed memories; and
(f) electronic control means for storing values dependent on output signals issued from said detector means into said automobile speed memories, respectively, in response to operation of said switch means, for reading the values, one at a time, from said automobile speed memories in response to



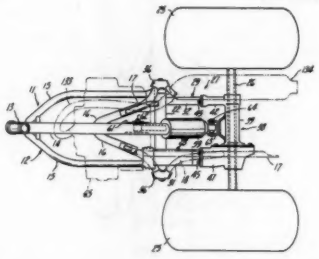
operaiton of said switch means, and for energizing said actuator means according to the read values.

4,540,061

DRIVE ARRANGEMENT FOR THREE WHEELED VEHICLES

Hiromitsu Watanabe, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 16, 1983, Ser. No. 475,838
Claims priority, application Japan, Mar. 29, 1982, 57-50387; Nov. 19, 1982, 57-203188
Int. Cl.[3] B62D *61/06*
U.S. Cl. 180—215 **33 Claims**



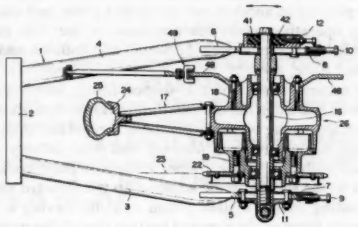
1. In a transmission for a vehicle or the like comprising frame means, at least one front wheel dirigibly carried by said frame means, a pair of rear wheels carried by said frame means, an engine carried by said frame means, and a transmission carried by said frame means, the improvement comprising said engine being positioned with its output shaft extending parallel to the axis of rotation of said rear wheels, said transmission having a primary shaft and a secondary shaft each carrying intermeshing gears for changing the speed ratio between said primary and said secondary shafts, said transmission shafts having their rotational axes extending parallel to the rotational axis of said rear wheels, means for driving said primary shaft from said engine output shaft, a drive shaft for driving said rear wheels and extending generally perpendicular to the axis of rotation of said rear wheels, means for driving said drive shaft from said transmission secondary shaft and an overload release device in the driving connection between said transmission secondary shaft and said rear wheels and remotely from the transmission secondary shaft.

4,540,062

REAR WHEEL SUPPORTING SYSTEM FOR MOTORCYCLE

Mikio Kashiwai, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 541,835
Claims priority, application Japan, Oct. 14, 1982, 57-180395
Int. Cl.³ B62K *25/04*
U.S. Cl. 180—227 **6 Claims**



1. A rear wheel supporting system for a motorcycle, including a frame, comprising:

a rear fork having a front end portion connected vertically pivotably to said frame and at least right and left members extending rearwards from said front end portion;

a rear axle having end portions respectively supported by the rear end portions of said right and left members of said rear fork;

a rear wheel driving means for driving a rear wheel which is mounted rotatably on said rear axle, said rear wheel driving means being mounted on said rear axle on one side of rear wheel; and

a rear wheel damping means disposed between said rear fork and said rear axle, wherein:

a first end portion of said rear axle on the side of said rear wheel driving means is supported fixedly by one of said right and left members of said rear fork, and

a second end portion of said rear axle on the opposite side to said first end portion is supported by the other member of said rear fork resiliently movably in the longitudinal direction of the motorcycle frame through a resilient support means;

said resilient support means comprising:

a collar fitted on said second end portion of said rear axle;

an axle holder connected to said rear fork, said axle holder having a recessed portion so formed as to permit movements of said collar only in the longitudinal direction of the motorcycle frame, said recessed portion having upper and lower inner faces extending substantially in parallel with each other in the longitudinal direction of said frame, said collar being disposed within said recessed portion; and

resilient means including at least one leaf spring disposed in a compressed state respectively between a front face of said concave portion and a front face of said collar and between a rear face of said recessed portion and a rear face of said collar.

4,540,063

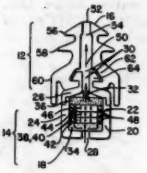
SOUND WAVE ATTENUATION DEVICE

Akira Ochi, Tokyo, and Toshihiko Asada, Komae, both of Japan, assignors to Park Trading Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,004
Claims priority, application Japan, Aug. 3, 1983, 58-141119
Int. Cl.³ A61B *7/02*
U.S. Cl. 181—135 **20 Claims**

1. A sound wave attenuation device having an outer shell with a first end having an inlet aperture and a second end having an outlet aperture and a sound wave attenuation unit contained within the outer shell and between and coaxial with the first and second ends forming a sound wave passageway such that environmental sound waves enter the device through the inlet aperture, penetrate said sound wave attenuation unit wherein sound waves are selectively attenuated and exit the device through the outlet aperture; said sound wave attenuation unit comprising:

(a) a first plate of a sound absorbing material positioned near the inlet aperture and substantially perpendicular to the direction of the sound wave passageway;



(b) second plate of a sound absorbing material positioned near the outlet aperture and substantially perpendicular to the direction of the sound wave passageway; and

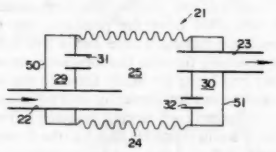
(c) a pair of sheets of a fabric of substantially uniform air permeability and elasticity disposed between said first and second plates and forming an air chamber between said sheets.

4,540,064

NOISE AND VIBRATION REDUCING APPARATUS FOR USE IN EXHAUST SYSTEM OF ENGINE

Ryuta Fujimura, Higashiyamato, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 22, 1983, Ser. No. 468,406
Claims priority, application Japan, Mar. 17, 1982, 57-41922
Int. Cl.³ F01N *1/02*
U.S. Cl. 181—227 **1 Claim**



1. A noise and vibration reducing apparatus for use in an exhaust system of an automobile power unit, comprising:

a cylindrical first exhaust conduit, fixed to the power unit, for conducting the exhaust gases from the power unit;

a second exhaust conduit, elastically supported by the body of the automobile, for venting the exhaust gases, and,

flexible means interposed between said first and second exhaust conduits and having a first end portion fixed to said first exhaust conduit, a second end portion fixed to said second exhaust conduit and a hollow middle portion extending between and being bounded by said first and second end portions to form therebetween a cylindrical expansion chamber which communicates with said first and second exhaust conduits, said middle portion consisting of a flexible bellows capable of expanding and contracting and capable of preventing vibration from being transmitted between said first and second exhaust conduits, the inner diameter of said middle portion being two to four times as large as the inner diameter of said first exhaust conduit, each of said first and second end portions

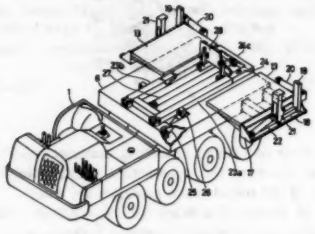
forming a resonance chamber communicating respectively with said expansion chamber.

4,540,065

APPARATUS FOR WALL TIMBERING OF DRIFTS, TUNNELS, AND THE LIKE

Seiji Kawaguchi; Takeki Fujiwara; Shigeo Kodama; Haruo Ito, and Kyuemon Yamamoto, all of Oodate, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,187
Claims priority, application Japan, Dec. 30, 1982, 57-233226
Int. Cl.³ E21D *15/58*
U.S. Cl. 182—63 **5 Claims**



1. An apparatus for wall and roof timbering of drifts and tunnels which comprises:

a self-moved truck having a forward part and a rearward part, a table mounted on the self-moved truck, the table is liftable to a desired height and is horizontally retainable, said table having a forward part a rear end and a top part;

a working platform having lateral sides with the working platform being rotatable mounted on the table and a forward bottom part;

auxiliary stages provided at the lateral sides of the working platform, and the auxiliary stages are extensible laterally outwardly from the working platform;

rotatable catcher means provided on the auxiliary stages for grasping a prop and swingingly erecting the prop; and

lift means provided to the working platform, which means is vertically swingable over the platform, the table comprises stays, each having a base and a free end with the base being pivotally fitted to the forward part of the truck and the free end being pivotally fitted to the rear end of the table, and means for elevating said table consisting of first piston cylinders each having base and a free end with each said base being pivotally fitted to the forward part of the truck and each said free end being pivotally fitted to a forward part of the table, and second piston cylinders each having a free end and a base with each said base being pivotally fitted to a forward part of the truck and each said free end being pivotally fitted to the free end of the stays;

the working platform consists of a box-like housing rotatable about an axis centrally provided on the table and upon a plurality of bearings located between the platform and the table and positioned radially outwardly from said axis with angular distances between the bearings;

guide cases provided within the housing of the working platform, and the auxiliary stages have arms slidably inserted in the guide cases, third piston cylinders accommodated within the housing of the working platform, said arms connected to said third piston cylinders and said third piston cylinders being operative to project the arms with the working stages laterally outwardly from the working platform;

the rotatable catcher means consists of a pair of plates which project with a distance therebetween from a lateral side of each of the auxiliary stages at a right angle therewith, a link plate rotatably pivoted to the said pair of plates, a catcher plate provided at one end of the link plate, a fourth piston cylinder having a free end pivotally fitted to the catcher plate and a base pivotally fitted to the auxiliary stage so as to selectively locate the link plate in a horizontal position or an inclined position, the catcher plate projecting over the level of the auxiliary stage in said horizontal position of the link plate, a catcher having a base pivotally fitted to the link plate a top projecting over the level of the auxiliary stage at the horizontal position of the link plate, and a middle part pivotally connected to a free end of a fifth piston cylinder, the fifth piston cylinder having a base pivoted to another end of the link plate, said catcher being operative, upon the actuation of the fifth piston cylinder to grasp a prop between said catcher and the catcher plate; and

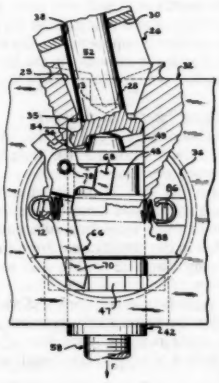
the lift means consists of a U-shaped lifting frame with a forward end and a middle part and having a base pivotally connected to the working platform, a reversed U-shaped sliding frame having a forward end and slidably connected with the lifting frame, a support plate rockably fitted to the sliding frame adjacent to the forward end of the sliding frame, a sixth piston cylinder having a base pivotally fitted to the forward bottom part of the working platform and a free end pivotally fitted to the middle part of the lifting frame, the sixth piston cylinder being operative to swing the lifting frame vertically, and a seventh piston cylinder having a base pivotally fitted to the base of the lifting frame and a free end pivotally fitted to the base of the sliding frame, said seventh cylinder being operative to extend the sliding frame from the lifting frame.

4,540,066

SELF-ADJUSTING PARKING BRAKE

Anthony C. Evans, Northville, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Apr. 9, 1984, Ser. No. 597,957
Int. Cl.³ F16D *65/56*
U.S. Cl. 188—71.9 **6 Claims**



1. An automatically adjusting parking brake actuating mechanism for use with an automotive brake assembly comprising:

thrust screw means attached to the friction pad means whereby said thrust screw axially translates in response to normal brake activating movement of said friction pad means;

adjusting nut means having an axial threaded bore threadingly receiving therein said thrust screw, said adjusting nut means including coaxial ratchet teeth and a peripheral groove externally circumscribing said adjusting nut means;

adjuster pawl means having a pivot, relative to said adjusting nut means, and including an adjusting leg communicating

with said ratchet teeth and a camming leg communicating with said peripheral groove whereby axial translation of said adjusting nut means affects pivotal movement of said adjuster pawl means thereby causing rotation of said ratchet teeth and said adjusting nut means relative to said thrust screw means;

means for applying an axial force upon said adjusting nut means thereby affecting axial translation of said adjusting nut means in combination with said thrust screw means to urge said friction pad means into a brake applying mode.

4,540,067

BRAKING SYSTEM INCORPORATING AT LEAST ONE SLIDING BRAKE DISC AND BRAKE DISC FOR SUCH A BRAKING SYSTEM

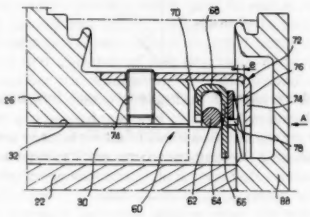
Guy Meynier, Aulnay S/Bois, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Feb. 15, 1984, Ser. No. 580,485

Claims priority, application France, Feb. 25, 1983, 83 03134

Int. Cl.³ F16D *55/36, 65/54*

U.S. Cl. 188—71.5 **5 Claims**



1. A braking system incorporating at least one brake disc capable of being braked by means of friction components, said disc being mounted to slide axially on and rotate with a rotating component, characterized in that the disc includes a device for returning and for memorizing a position and which enables the disc to be always at a predetermined distance relative to one of the friction components when the brake is not applied, irrespective of the wear of said one friction component, the device for returning and for memorizing including a friction ring cooperating with said rotating component and an elastic component which pushes apart said friction ring and a portion fixed firmly to said disc, the elastic component comprising spring means that allows, between said portion and said friction ring, a limited relative axial movement for the predetermined distance beyond which the portion axially displaces said ring, the friction ring comprising a cage retaining axially an annular spring mounted in frictional engagement in splines of said rotating component, and said portion comprising a sleeve fixed firmly to said disc and having a radially folded portion to retain between the radially folded portion and cage the spring means which comprises an undulating washer.

4,540,068

DISC BRAKE

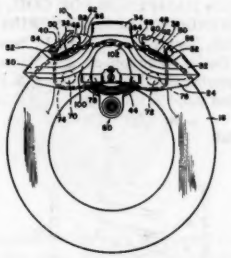
Irving R. Ritsema, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Feb. 22, 1983, Ser. No. 468,241

Int. Cl.³ F16D *65/20*

U.S. Cl. 188—73.39 **17 Claims**

1. A disc brake comprising a caliper assembly cooperating with a pair of brake pads to selectively engage the latter with a disc to be braked and the caliper assembly being adapted for axial movement relative to a torque member during braking, the caliper assembly including an actuation leg on one side of the disc carrying a hydraulic actuator operable to directly engage one of the pair of brake pads with the disc and impart axial movement to the caliper assembly, the caliper assembly including a reaction leg on the other side of the disc urging the other brake pad into engagement with the disc, and the caliper assembly including a pair of end bridges at the circumferential extremities thereof and extending over the disc in order to connect the actuation leg with the reaction leg, characterized by said caliper assembly further including an integrally formed center bridge separate from said pair of end bridges and extending over said disc to further connect said actuation leg with said reaction leg, said center bridge cooperating with said reaction leg to render the same substantially rigid whereby said



center bridge opposes deflection of said reaction leg during braking, said center bridge cooperating with said pair of end bridges to define a pair of openings on opposite circumferential sides of said center bridge, the reaction leg defining a single central recess opposite said hydraulic actuator which are both aligned with said center bridge, and a reinforcing rib on the reaction leg extending axially away from said disc and said reaction leg, said reinforcing rib forming a portion of a boundary of said central recess.

4,540,069

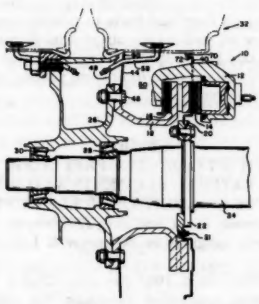
DISC BRAKE ASSEMBLY AND DUST SHIELD MEANS THEREFORE

Daniel L. Bolenbaugh, South Bend, Ind., and Roger L. Smith, Niles, Mich., assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 30, 1983, Ser. No. 538,046

Int. Cl.³ F16D *65/00*

U.S. Cl. 188—218 A **4 Claims**



1. A disc brake assembly and dust shield means therefor comprising a caliper assembly cooperating with a pair of friction pads to engage the latter with a rotor to be braked, the caliper assembly being mounted to an axle flange of a vehicle, the rotor being coupled to a hub which rotates on the axle and carries a wheel assembly for the vehicle, characterized in that said dust shield means comprises an inboard plate attached to said axle flange and extending radially outward to but slightly spaced from said wheel assembly and an outboard plate at-

tached to said hub in order to rotate with said rotor, said outboard plate further comprising two parts extending radially outward from said hub to said wheel assembly, the radially outer periphery of said outboard plate engaging said wheel assembly and said inboard plate cooperates with said outboard plate and said wheel assembly to substantially define a cavity for receiving said rotor whereby said rotor and said friction pads are substantially isolated in said cavity from contaminants such as dust and stones on the surface traversed by the vehicle.

4,540,070

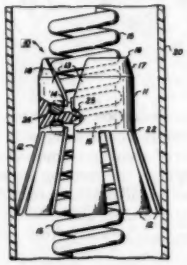
VIBRATION DAMPENER FOR COIL TENSION WINDOW BALANCE SPRING

John R. Yonovich, Shortsville; William P. Newton, Rochester, and Brian S. Dense, Macedon, all of N.Y., assignors to Caldwell Manufacturing Co., Inc., Rochester, N.Y.

Filed Jul. 19, 1984, Ser. No. 632,244

Int. Cl.³ F16F *7/10*

U.S. Cl. 188—380 **14 Claims**



1. A vibration dampener for a coiled tension window balance spring within a spring cover, said vibration dampener comprising:

a. a resin body having a wall shaped for fitting around said coiled tension spring;

b. said wall having a slot oriented longitudinally of said spring when said body is mounted on said spring;

c. said wall being flexible enough to allow said slot to spread open so that said body can be pressed onto a mid region of said spring;

d. resilient fins extending obliquely outward from said body; and

e. when said body is mounted on said spring, said fins extending far enough from said body to flexibly engage an interior surface of said spring cover and thereby hold said body and said spring spaced away from said interior surface of said spring cover to prevent rattling of said spring within said cover.

4,540,071

CASE WITH AN OBSTACLE-FREE BASIC FRAME ELEMENT, LATERAL ELEMENTS AND DIFFERENT TYPES OF ADDITIONAL ELEMENTS

Michael M. Schaub, Basel, and Jörg Zintzmeyer, Zürich, both of Switzerland, assignors to Zintmeyer & Lux AG, Switzerland

Filed Jul. 6, 1983, Ser. No. 525,042

Claims priority, application European Pat. Off., Nov. 12, 1981, 81109646.0

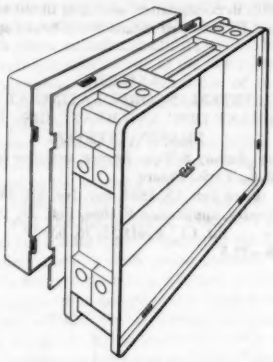
Int. Cl.³ A45C *3/02*

U.S. Cl. 190—121 **9 Claims**

1. A case, comprising:

a first rigid basic frame element defining a closed figure in plan view, said element including in transverse cross section a base member and two leg members extending radially outwardly and substantially perpendicularly from said base member at ends thereof, said base member being unitarily formed with said leg members as one piece, said base and leg members defining a laterally and outwardly opening recess, said base member having a substantially smooth inner surface;

connection means, on each side of said first basic frame element, for releasably coupling said first element to other, similar basic frame elements;



side members releasably coupled to said first basic frame element; and

accessory means coupled to said first element in said recess and including locking members wholly located in said recess.

4,540,072

BRAKE HOLDER

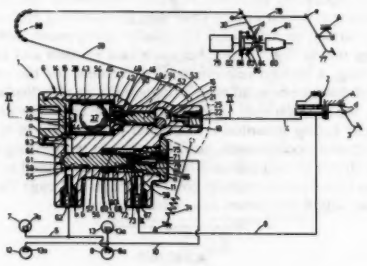
Shoji Suzuki, and Ichiro Ishiwata, both of Kanagawa, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Jun. 16, 1982, Ser. No. 389,027

Claims priority, application Japan, Jun. 27, 1981, 56-99877; Jun. 27, 1981, 56-99878

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—4 A **27 Claims**



1. A brake control apparatus for an automobile having a brake fluid pressure generating source actuatable by a driver, at least two wheels with wheel cylinder, and at least two brake fluid pressure systems, one of said systems being connected between said brake fluid generating source and one of said wheel cylinders of the wheels, and another of said systems being connected between said brake fluid generating source and another of said wheel cylinders of the wheels; said brake control apparatus, in one of said brake fluid pressure systems, comprising:

(A) a first main body having a first bore, a first chamber, a first inlet communicating with said first bore, and a first outlet communicating with said first chamber, said first

inlet being connected to said brake fluid pressure generating source, said first outlet being connected to one of said wheel cylinders, and said first bore, first chamber, first inlet and first outlet defining a brake fluid passage between said brake fluid pressure generating source and said one of the wheel cylinders;

(B) a movable valve member arranged in said first chamber, and moved by its weight when the automobile is facing upwardly on an inclined roadway;

(C) valve means arranged in said first bore, and engageable with said movable valve member to check brake fluid flow between said brake fluid pressure generating source and said one of the wheel cylinders; and

(D) displacing means for displacing said movable valve member in response to stop operation of said automobile for opening and closing said valve means when said automobile is facing upwardly on said inclined roadway;

and said brake control apparatus, in another of said brake fluid pressure system, comprising:

(E) A second main body having a second bore, a second inlet connected to said brake fluid generating source, and a second outlet connected to another of said wheel cylinders;

(F) a valve control piston slidably fitted to said second bore to form second and third chambers at both ends in said second main body, said second chamber communicating with said first chamber of said first main body, and said third chamber communicating with said second outlet;

(G) second valve means arranged in a brake fluid passage between said second inlet and outlet, and engageable with said valve control piston to block brake fluid flow towards said second inlet from said second outlet, said valve control piston being moved to said second valve means, when an urging force to said valve control piston from said second chamber becomes higher than another urging force to said valve control piston from said third chamber and to be engaged with said second valve means.

4,540,073

WHEEL HUB WITH REDUCTION GEAR AND MULTIPLE DISC BRAKE

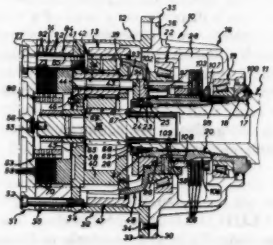
Léonce Rogier, Saint-Denis, France, assignor to SO.M.A. Europe Transmission-Societe Nouvelle Mecanique et Automobile, Saint-Etienne, France

Filed Nov. 22, 1982, Ser. No. 443,689

Claims priority, application France, Nov. 23, 1981, 81 21885

Int. Cl.³ F16D *65/32*; B60K *41/26*

U.S. Cl. 192—4 A **17 Claims**



1. A wheel hub comprising a hollow body, said hollow body housing a reduction gear and a brake, said reduction gear having a shaft, said brake including a plurality of brake discs, at least one of said brake discs being rotationally fast with said shaft of said reduction gear, said brake further including a plurality of interpolated discs alternating with said brake discs, a single support column mounting with play each of said interpolated disc for axially movement thereon, said support column being disposed parallel to and spaced from said reduction gear shaft.

4,540,074

CLUTCH ASSEMBLY FOR GEAR TRANSMISSION

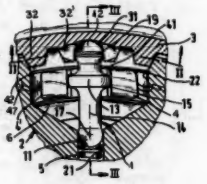
Alfred Magg, and Walter Griesser, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,292

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221712

Int. Cl.³ F16D *23/06*

U.S. Cl. 192—53 G **12 Claims**



1. In a gear transmission having a first gear, a second gear coaxial with said first gear, said gears being provided with respective sets of external teeth of like pitch and diameter, and an internallly toothed sleeve meshing only with the teeth of said first gear in a decoupling position, said sleeve being axially slidable into a coupling position in which it meshes with the teeth of said first and second gears for positively connecting same to each other,

the combination therewith of a synchro ring coaxially interposed between said gears with freedom of limited rotation relative to said first gear, said synchro ring and said second gear being provided with confronting clutch surfaces separated by a small clearance from each other in the decoupling position of said sleeve, a detent member universally jointed to said first gear, resilient means on said first gear exerting a radially outward force upon said detent member, a free end of said detent member extending substantially radially into an axially disposed inner guide groove of said sleeve in said decoupling position while being positively entrainable by said synchro ring in either peripheral direction, said guide groove being provided with lateral pockets to receive the free end of said detent member upon a relative angular disalignment of said synchro ring and said first gear from a normal median position, such disalignment resulting from a speed difference between said first and second gears upon the establishment of frictional contact between said clutch surfaces by an axial thrust exerted upon said synchro ring via said detent member whose free end is indexable on said sleeve for peripheral entrainment thereby upon an incipient axial coupling shift thereof, said lateral pockets being bounded by camming edges dislodging said free end therefrom in response to a continuing axial thrust upon establishment of substantial synchronism between said gears for enabling a completion of said coupling shift.

4,540,075

COMBINED BEARING AND VARIABLE SPEED VISCOUS COUPLING

Mariano Delpercio, and Edward W. Molloy, both of Port Clinton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 17, 1984, Ser. No. 611,135

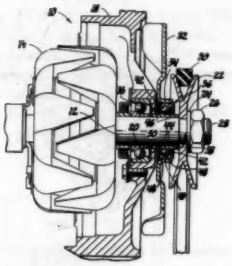
Int. Cl.³ F16D *31/00*

U.S. Cl. 192—58 R **3 Claims**

1. A combined bearing and variable speed viscous coupling wherein rolling elements of a bearing both support a driven rotary member relative to a powered rotary member and cooperate to allow the powered member to variably drive the driven member, comprising,

a bearing having a first race adapted to be rigidly joined to the powered member and a second race adapted to be rigidly joined to the driven member with a complement of rolling elements disposed therebetween to support the rotary members in co-axial relation for relative rotation,

and a viscous material interposed among the rolling elements and sealed with respect thereto and having a viscosity chosen so as to sufficiently frictionally retard the rolling of



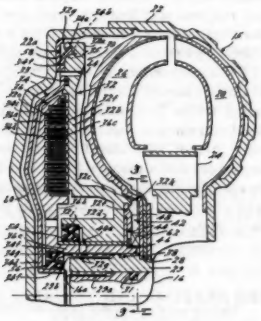
the rolling elements between the races such that the powered member will drive the driven member in a substantially one-to-one relation when the powered member is rotating below a predetermined speed, while allowing the rolling elements to roll between the races sufficiently such that the powered member may overrun the driven member when the powered member is rotating above said predetermined speed.

4,540,076

TORQUE CONVERTER VISCOUS BYPASS COUPLING WITH IMPROVED SEAL ARRANGEMENT

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 25, 1984, Ser. No. 623,862
Int. Cl.³ F16D *31/00*
U.S. Cl. 192—58 B **14 Claims**



1. In a viscous coupling of the type including an annular housing assembly adapted to be positioned within the housing of a fluid coupling and defining an annular chamber containing a viscous fluid; an annular clutch assembly disposed in the chamber, the clutch assembly including an axially extending central hub portion adapted for rotational driving and sliding connection to a shaft in the fluid coupling housing and an annular radially extending clutch portion having working means for viscous clutching coaction with a spaced working means on a confronting portion of the annular housing; the improvement comprising:

first (**32**) and second (**34**) radially extending annular side wall members forming said annular housing and defining said chamber, said first side wall member having an annular axially extending hub portion (**32*d***) at its radially inner edge journaled on the outer peripheral surface of the central hub portion (**36*e***), said side wall hub portion and said clutch assembly providing the sole radial and axial support for the housing assembly, and said second side wall member having an annular axially extending lip portion at its radially inner edge spaced radially inward of the clutch hub portion; and

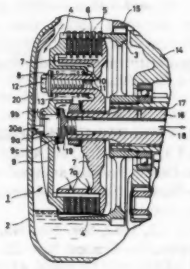
first and second dynamic seals disposed on radially opposite sides of said central hub portion, said first seal disposed between a radially inner surface of said first side wall member and the outer peripheral surface of the central hub portion, and said second seal disposed between a radially outer portion of said lip portion of said second side wall member and a radially inner peripheral surface of said central hub portion.

4,540,077

CLUTCH COOLING DEVICE

Kuniyuki Yamamoto, Tokyo, and Kazuo Ohyama, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 425,777
Claims priority, application Japan, Sep. 28, 1981, 56-142674[U]
Int. Cl.³ F16D *13/72*
U.S. Cl. 192—70.12 **7 Claims**



1. A clutch cooling device for a power transmission unit having a friction clutch disposed on a wall of a crankcase in which a speed change gear assembly is accommodated, wherein said clutch includes a clutch pressure plate having central throughhole means for guiding coolant oil toward friction discs through one or more radial slot and a clutch cover having an inner wall confronting said central throughhole means and an oil guide rib projecting therefrom into said central throughhole means.

4,540,078

CLUTCH LUBE CONTROL

Peter D. Wetrich, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

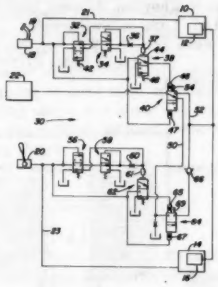
Filed Oct. 27, 1983, Ser. No. 545,981
Int. Cl.³ F16D *25/10, 13/72*
U.S. Cl. 192—87.11 **6 Claims**

1. In a vehicle having a torque-transmitting clutch with a clutch lube circuit and having engaged and disengaged states, an operator control for controlling the engagement state of the clutch and a source of lube fluid, a system for controlling flow of lube fluid to the lube circuit, comprising:

a lube valve having an inlet for receiving lube fluid, an outlet coupled to the lube circuit and a spool movable between a

first position wherein lube flow between the inlet and outlet is reduced and a second position wherein lube flow is increased; and

control means coupled between the operator control and the lube valve and responsive to the operator control for



normally maintaining the lube valve in its first reduced flow position and for temporarily maintaining the lube valve in its second increased flow position for a certain time period following a predetermined change in the engagement state of the clutch.

4,540,079

MULTIPLE DISK CLUTCH FOR MOTOR VEHICLES

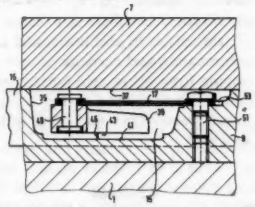
Achim Link, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 26, 1983, Ser. No. 545,755

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3239962

Int. Cl.[3] **F16D** *13/69, 13/71*

U.S. Cl. 192—109 R **6 Claims**



1. A multiple disk clutch for motor vehicles, comprising:

(a) a flywheel;

(b) a clutch housing secured detachably to the flywheel;

(c) a presser plate guided non-rotatably but axially displaceably on the clutch housing;

(d) an intermediate disk guided non-rotatably but axially displaceably on the clutch housing, axially between the flywheel and the presser plate;

(e) two clutch disks of which the first disk is arranged axially between the presser plate and the intermediate disk and the second disk is arranged axially between the intermediate disk and the flywheel;

(f) at least one spring stressed in between the presser plate and the clutch housing and resiliently stressing the presser plate axially towards the flywheel;

(g) at least one first stop facing the flywheel provided on the intermediate disk; and

(h) at least one oppositely directed second stop arranged in the axial displacement path of the first stop provided on the clutch housing or a component firmly connected with the clutch housing independently of its disengageable flywheel fastening, the axial interval of the two stops being smaller than the spacing of the intermediate disk from the flywheel which is determined by the second clutch disk.

4,540,080

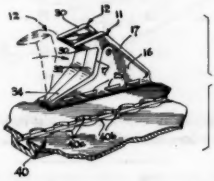
END STOP FOR CARGO LOADING SYSTEM

Arnold B. Nordstrom, Torrance, Calif., assignor to Ancra Corporation, El Segundo, Calif.

Filed Sep. 29, 1982, Ser. No. 426,720

Int. Cl.[3] **B65G** *11/20;* **B60N** *1/00*

U.S. Cl. 193—40 **6 Claims**



1. An end stop member for installation in a track member for restraining the motion of cargo handling means, said track member having a plurality of cutout portions spaced between lip portions comprising:

(1) a pair of similar body members, each of said body members comprising:

(a) stop plate means for terminating the travel of said cargo handling means,

(b) tension lug means extending normally and outwardly from the surfaces of said body members,

(c) shear lug means extending outwardly and substantially normally from the surfaces of said body members directly opposite and above the tension lug means, said shear lug means being arranged and aligned substantially parallel to the longitudinal axis of the tension lug means,

(d) an overhanging restraining arm extending from the top edge of the stop plate means in a direction substantially parallel to the longitudinal axis of the tension lug means,

(e) a sloped shoulder portion extending downwardly and outwardly from the bottom edge of the stop plate means, and

(2) means for joining said body members together with the tension lug means installed in said track beneath the lip portions thereof and the shear lug means installed in the cutout portions of said track.

4,540,081

BILL ACCEPTING DEVICE AND METHOD FOR CONTROLLING ACCEPTING OF BILLS

Yoshikazu Mori, Saitama, and Osamu Kobayashi, Sakado, both of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed Jul. 15, 1983, Ser. No. 514,185

Claims priority, application Japan, Jul. 20, 1982, 57-125020

Int. Cl.[3] **G07F** *7/04*

U.S. Cl. 194—4 C **11 Claims**

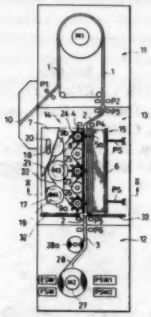
1. A bill accepting device comprising:

a bill discrimination section for discriminating whether an inserted bill is true or not;

an escrow section means for retaining a bill accepted by said bill discrimination section as a true bill and returning the retained bill via a bill conveying passage; and

a stocker section provided between said bill discrimination section and said escrow section means, said bill conveying passage being included in said stocker section and connecting said bill discrimination section and said escrow

section means, said stocker section receiving a bill present in said bill conveying passage at a predetermined accumulating location by moving said bill in a direction in which said bill crosses said bill conveying passage.

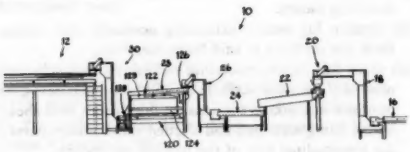


4,540,082

VIBRATORY DISTRIBUTION SYSTEM

Keith L. Maddocks, Barton, England, assignor to KMG Systems Limited, Bedfordshire, England

Filed May 17, 1983, Ser. No. 495,398
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—358 **10 Claims**



1. A distribution system for conveying flowable material from a source downstream to a plurality of successive user locations, comprising:

a conveyor means comprising a plurality of successive, elongate primary conveyor sections, each conveyor section having a product carrying surface tilted relative to the horizontal about the longitudinal axis of the conveyor section whereby said product tends to gravitate towards the lower side edge region of said surface as the product travels along said section, and a side wall upstanding on said lower side edge region for retaining the product on the conveyor section;

means for vibrating each said primary conveyor section for conveying said material towards a respective one of said locations;

and wherein each said side wall has an opening for allowing product to fall from said conveyor section;

a plurality of vibratable secondary conveyor sections for receiving the fallen product and conveying said product to each said user location; and

a flowable product storage unit arranged upstream of said conveyor means, the storage unit comprising:

inlet and outlet means;

a lower conveyor section connected to said outlet means;

an upper conveyor section connected to said inlet means, said upper conveyor section overlaying said lower conveyor section;

respective means for vibrating said conveyor sections for conveying product from said inlet means and to said outlet means; and

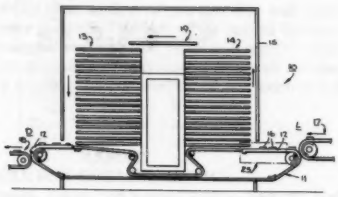
a plurality of gates in the lower surface of said upper conveyor section for allowing product conveyed along said upper conveyor section to fall onto said lower conveyor section.

4,540,083

UNLATCH ASSEMBLY FOR A CONVEYOR SYSTEM

James R. Cowdery, Pelham, N.H.; David B. Park, Wilmington, and Rouzas R. Khoylian, Belmont, both of Mass., assignors to Santrade Ltd., Luzerne, Switzerland

Filed Feb. 28, 1980, Ser. No. 125,354
Int. Cl.³ B65G *47/57*
U.S. Cl. 198—465.1 **15 Claims**



1. In combination with a conveyor system having a plurality of carriers, each said carrier having a rod at a forward end thereof and at least one depending hook on said rod; a main conveyor for moving a sequential series of said carriers along a horizontal path, said conveyor having a plurality of longitudinally spaced hooks for respectively engaging said rod of each respective carrier and an endless chain for moving said hooks of said conveyor along said horizontal path; and a second conveyor having pairs of opposed tracks disposed in vertically stacked relation for sequentially receiving and conveying said carriers in a vertical plane; an unlatch assembly for sequentially unlatching and moving each carrier from said main conveyor onto a respective pair of tracks of said second conveyor, said unlatch assembly comprising

an upwardly inclined trackway below said horizontal path,

a carriage movably mounted on said trackway and having a horizontally disposed bar thereon to engage said hook in said rod of said carrier in said horizontal path, and

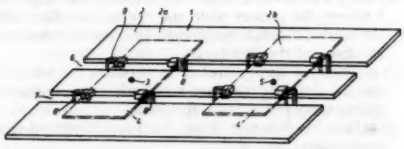
means for reciprocating said carriage on said trackway with said bar moving from below said horizontal path into and through said path to engage a carrier therein while moving at a speed greater than said hook of said main conveyor in said path.

4,540,084

DEVICE FOR AUTOMATICALLY TRANSFERRING PRINTED CIRCUIT BASE PLATES FROM THE LOADING TO THE PRINTING ZONE

Ezio Curti, Viale Regina Giovanna, 38, 20100 Milan, Italy

Continuation-in-part of Ser. No. 357,214, Mar. 11, 1982, abandoned. This application Mar. 18, 1983, Ser. No. 476,516
Claims priority, application Italy, Nov. 9, 1981, 24923 A/81
Int. Cl.³ B65G *25/02*
U.S. Cl. 198—468.3 **15 Claims**



1. An apparatus for automatically transferring printed circuit base plates from a loading zone to a printing zone, comprising:

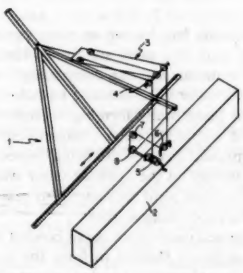
a horizontal support plane divided into a loading zone and a printing zone;
guide means extending parallel to said plane; and
plier gripper means, movably mounted on said guide means, for gripping a base plate and for moving the base plate horizontally across said plane and vertically relative to said plane, said gripper means including
a first column support having a relatively fixed first gripping element at an upper end thereof and a first sliding sleeve at a lower end thereof,
a second column support having a relatively movable second gripping element at an upper end thereof and a second sliding sleeve at a lower end thereof, and
a projecting arm with an inclined plane supported by a third sliding sleeve,
said sliding sleeves being slidably coupled to said guide means.

4,540,085

DEVICE FOR RAKING A STORAGE HEAP

Erik R. Larsen, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Jun. 23, 1982, Ser. No. 391,465
Claims priority, application United Kingdom, Jun. 24, 1981, 8119425
Int. Cl.³ B65G *65/10*
U.S. Cl. 198—519 **13 Claims**



1. An arrangement for a raking device which travels in a reciprocating direction comprising:
(a) a harrow which moves along a bridge positioned parallel to a baseline, and attached at a point above the base line by a flexible tension element to a tower, said tower being situated such that the flexible tension element which connects the harrow to the tower lines on one side of a plane which is oriented subsequently perpendicular to the bridge and which runs through the point of attachment, and
(b) a hoist having a velocity ratio and at least one pulley located between the support and the harrow, through which the flexible tension element is reeved, to adjust the inclination of the harrow,
said raking device characterized in that the length of the flexible tension element is continuously adjusted in direct response to the position of the harrow along the bridge so as to ensure that any motion of the harrow is substantially linear.

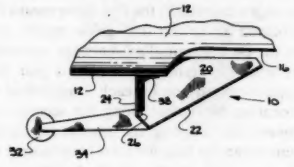
4,540,086

GRAIN AUGER CLOSING SPOUT

Gary L. David, P.O. Box 7102, Wichita, Kans. 67207, and David W. Harrington, 2621 W. Central, Wichita, Kans. 67203

Filed Apr. 16, 1984, Ser. No. 600,364
Int. Cl.³ B65G *47/44*
U.S. Cl. 198—536 **10 Claims**

1. A grain auger closing spout for use on a combine auger housing which automatically opens when the auger is running and closes when the auger stops, comprising:
a collecting bucket including side walls, slanted bottom and a back wall;
flexible seal means forming an extension of the back wall to seal the collecting bucket against the auger housing in the closed position;
a pair of mounting brackets attached to the auger housing;



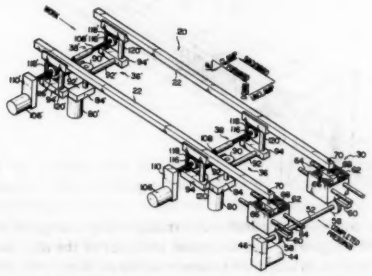
pivot means attaching the collecting bucket to the mounting brackets, one mounted on each side of the auger housing; and
counterweight means carried on arms attached to the bucket extending away from the bucket and pivot means tending to pivot the bucket upward to its closed position when the bucket is empty but insufficient when the bucket is full from pivoting downward to dump the contained grain in its open discharge position.

4,540,087

THREE-DIMENSIONAL WORK TRANSFER APPARATUS

Masakatsu Mizumoto, Kanazawa, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 524,080
Claims priority, application Japan, Aug. 19, 1982, 57-142693; Aug. 19, 1982, 57-124444[U]; Aug. 19, 1982, 57-124445[U]; Aug. 19, 1982, 57-124446[U]; Aug. 19, 1982, 57-124447[U]
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—621 **8 Claims**



1. An apparatus for transferring work in three dimensions through a succession of processing stations in a transfer press or the like, comprising:
(a) a pair of transfer bars extending in parallel spaced relation to each other;
(b) a feed mechanism adjacent one end of the transfer bar pair for longitudinally moving the same back and forth;
(c) first drive means including a first DC servomotor for driving the feed mechanism;
(d) a pair of clamp mechanisms adjacent the opposite ends of the transfer bar pair for conjointly moving the transfer bars toward and away from each other;
(e) second drive means including a second DC servomotor for driving each of the clamp mechanisms;
(f) a pair of lift mechanisms adjacent the opposite ends of the

transfer bar pair for conjointly moving the same up and down; and

(g) third drive means including a third DC servomotor for driving each of the lift mechanisms;

the first, second, and third DC servomotors being controlled in time relation to each other to cause the operation of the feed, clamp, and lift mechanisms, respectively, in a predetermined sequence; and

said feed mechanism having first guide means extending longitudinally of the transfer bar pair, a pair of longitudinal carriages coupled to the first drive means thereby to be reciprocated along the first guide means, second guide means on each longitudinal carriage extending at right angles with the transfer bar pair, a pair of transverse carriages mounted one on each longitudinal carriage for reciprocating movement along the second guide means, and means for coupling the transverse carriages to the respective transfer bars for joint longitudinal travel of the transfer bars with the longitudinal carriage means while allowing the transfer bars to move up and down relative to the transverse carriages.

4,540,088

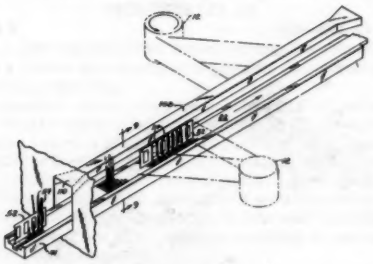
COMPONENT CONVEYOR APPARATUS

John C. Bergh, Elkhart, Ind., assignor to Wheelabrator-Frye Inc., Mishawaka, Ind.

Filed Jun. 20, 1983, Ser. No. 506,008

Int. Cl.³ B65G *49/06*

U.S. Cl. 198—803.15 **9 Claims**



1. A conveyor apparatus for transporting elongated work pieces through a surface treatment chamber or the like, including a continuous loop belt means retained between two pulleys defining opposite ends of the conveyor belt loop; one of the pulley means operatively coupled to a motor to drive the belt means; a plurality of resilient retention pins on the belt means extending outwardly from a surface thereof, the pins defining a pair of spaced parallel rows extending around the longitudinal circumference of the belt means; a loading zone generally at one end of the belt means including means for applying a force on the outward ends of the pins for transversely separating the pins defining the pin rows thereby creating an opening therebetween adapted to receive the work pieces; means in the treatment chamber for applying a force on the outward ends of the pins for urging the pins transversely inwardly into secure engagement with a work piece therein; means for releasing the pins from engagement with the work pieces following surface treatment or the like.

4,540,089

BAG AND BAG MAKING APPARATUS

John Maloney, Alsager, England, assignor to Johnsen & Jorgensen Jaypak Limited, London, England

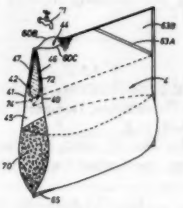
PCT No. PCT/GB82/00082, § 371 Date Nov. 18, 1982, § 102(e) Date Nov. 18, 1982, PCT Pub. No. WO82/03208, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 10, 1982, Ser. No. 444,899

Claims priority, application United Kingdom, Mar. 18, 1981, 8108402; Jul. 11, 1981, 8121451

Int. Cl.³ B65D *25/08*

U.S. Cl. 206—219 **23 Claims**



1. A composite bag having an outer periphery including a top, bottom and two sides and being formed from flexible waterproof material, said bag comprising:

(a) opposed outer walls forming an outer compartment and opposed inner walls forming an inner pocket which is disposed within the outer compartment,

(b) the opposed inner walls being joined along the entire length thereof to the opposed outer walls forming a hermetically tight joint therealong to seal the inner pocket from the outer compartment,

(c) the opposed outer walls being bonded together along the outer periphery thereof to form the outer compartment except for a shortened bonded section effective to form an open mouth leading to the inside of the inner pocket for receiving liquid (matter) therein,

(d) the bonded outer periphery further including a material insertion opening along a portion of the outer periphery other than the top of the bag,

(e) the material insertion opening being effective to be sealed after material has been inserted into the outer compartment through said insertion opening,

(f) a portion of the inner pocket being frangible to allow the pocket to be ruptured by manual pressure to discharge the liquid from the inner pocket into the outer compartment after the material insertion opening has been sealed to mix the contents therein with the liquid,

(g) the combination of said pocket, outer compartment and open mouth being effective to allow the pocket to remain empty and open to receive a measured amount of liquid fed through the open mouth by the user just before the time of rupture for effecting mixing between the liquid and material in the outer compartment,

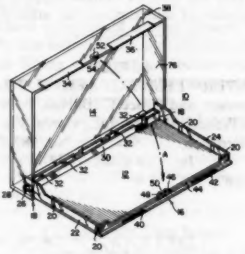
(h) the opposed inner walls forming the pocket are adapted to assume a face-to-face abutting relationship when the liquid has been discharged from the pocket into the outer compartment after rupture of the pocket so that the abutting faces are in a self-sealing position whereby the abutting faces serve as a non-return valve obstructing the passage of liquid and material to the open mouth, thereby retaining the contents during the mixing thereof by manipulation of the bag.

4,540,090

CASSETTE STORAGE CONTAINER

Paul J. Gelardi, Cape Porpoise, and Robert B. MacLeod, Jr., Biddeford, both of Me., assignors to Shape, Inc., Biddeford, Me.

Filed Jun. 15, 1984, Ser. No. 620,816
Int. Cl.³ B65D *85/67*
U.S. Cl. 206—387 **2 Claims**



1. A videotape cassette storage container capable of opened and closed positions and having a cover with a front, a back and sides and a base with a front, a back and sides, comprising:

(a) a pivoting mechanism allowing movement of the cover relative to the base having

(i) a pin formed on each side of the base,

(ii) a hole formed in each side of the cover for receiving each pin, and

(iii) a rounded back on the base,

(b) a latch mechanism having

(i) a latch projection formed perpendicularly on the front of the cover within the area defined by the cover, and

(ii) an interference recess formed in the front of the base between two latch members and within the area defined by the base for receiving the latch projection, wherein the latch projection is inserted into the recess between the two latch members in a direction substantially perpendicular to the base during closing,

(c) gripping means for facilitating gripping of the cassette storage container during opening and closing having

(i) a first and second indentation formed along part of the outside front of the cover, and

(ii) first and second serated projections formed along part of the outside front of the base adjacent to the first and second indentations, respectively, and

(d) means for limiting the play between the sides of the cover and the sides of the base having inclined ribs formed on each side of the base for abutting each side of the cover in the closed position.

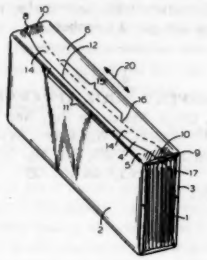
4,540,091

FOIL PACKAGE FOR PAPER HANDKERCHIEFS OR TISSUES

Wilhelm Haböck, Altmünster, Austria, assignor to Papierfabrik Laakirchen Aktiengesellschaft, Laakirchen, Austria

Filed Jul. 13, 1983, Ser. No. 513,363
Claims priority, application Austria, Jun. 1, 1983, 2013/83
Int. Cl.³ B65D *75/58, 83/00*
U.S. Cl. 206—494 **5 Claims**

1. A miniature parallelepiped package of paper handkerchiefs comprising a stack of a small number of folded handkerchiefs and a length of a foil enveloping the stack of handkerchiefs, the enveloping foil having two opposite wide sides, two opposite short narrow sides and two opposite elongate narrow sides having straight short end edges, the enveloping foil having adjoining end segments extending from the wide sides to one of the elongate narrow sides and one of the end segments overlapping the other end segment on the one elongate narrow side to form a flap, the end segments of the foil being connected to each other along the short end edges of the one elongate narrow side and the flap having a convex rim centrally between the connections of the end segments whereby



the flap may be lifted off the other end segment to form a dispensing opening for withdrawal of the handkerchiefs from the package between the connections.

4,540,092

SECURITY DISPLAY RACK

John DeSantis, 115 Overlook Ave., Staten Island, N.Y. 10304

Filed Apr. 24, 1984, Ser. No. 603,493
Int. Cl.³ E05B *73/00*
U.S. Cl. 211—4 **9 Claims**

1. A display rack for securely displaying clothing while permitting the clothing to be tried on by a consumer, said rack comprising, a support stand and a hanger support bar mounted on said stand, said hanger support bar being hollow and having an elongated slot formed herein and a plurality of apertures along its length joined with said slot, a plurality of individual elongated flexible guard members having at least one enlarged head portion at one end thereof dimensioned to fit in any one of said apertures while preventing withdrawl through said slot, said guard member being adapted to pass through a portion of a garment placed on a conventional hanger supported on said hanger support bar, means movably mounted in said hanger support bar for movement between first and second positions blocking and unblocking said apertures thereby to prevent removal of said guard members from the hanger support bar in said first position, means for locking said movably mounted means in the first position thereof; and means for cooperating with the other end of said guard members for selectively preventing removal of a garment in which the guard member is secured; said other end of said guard members having enlarged head portions and said cooperating means comprising a hollow

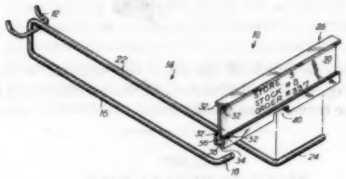
security bar mounted on said support stand having an elongated slot and at least one aperture therein joined with a slot for receiving the enlarged head portions of the other ends of the guard members, and means for selectively blocking and unblocking said aperture in the security bar to control removal of garments from the guard members.

4,540,093

DISPLAY HOOK APPARATUS

Milton J. Merl, 151 S. Mountain Rd., New City, N.Y. 10956, and Silvio J. Di Marchi, 9 Ward Ave., Wyckoff, N.J. 07481

Filed Jun. 23, 1983, Ser. No. 507,245
Int. Cl.³ A47F *5/00*
U.S. Cl. 211—59.1 **7 Claims**



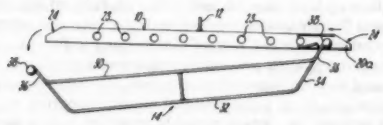
1. An apparatus for the support and display of a group of related products from a vertical surface along a horizontal row, comprising first and second front channel membr support means mountable upon the vertical surface in a horizontaly spaced-apart relationship, each of said support means comprising mounting means adapted for mounting upon the vertical surface and an arm having a first end extending outwardly from said mounting means; a front channel member having front and rear surfaces pivotably mounted upon said first ends of said first and second support means such that said channel member normally depends therefrom, exposing said front surface and may be pivoted upwardly to expose said rear surface, whereby display information relating to the products may be located on said first surface and secondary information may be available for viewing when said channel member is pivoted upward; and product bracket means mounted to and extending outwardly from said mounting means below said support means such that products may be displayed therefrom behind said front channel member.

4,540,094

PRODUCT HANGER

Lyle W. Norrie, Etobicoke, and Richard I. Pawlicki, Scarborough, both of Canada, assignors to Knud Simonsen Industries Ltd., Rexdale, Canada

Filed Sep. 22, 1982, Ser. No. 421,154
Int. Cl.³ A47F *5/08*
U.S. Cl. 211—113 **9 Claims**



1. A support assembly for supporting products on a processing line transversely of said line each said support assembly comprising:

a support bar having a continuous hollow tubular interior along its length and having two ends;

a continuous slot along said support bar of predetermined width;

an opening at each end of said support bar, communicating with said slot, said opening having a dimension greater than the predetermined width of said continuous slot;

hanger means shaped and adapted for supporting products therefrom and having two ends, and an intermediate hanger portion, and,

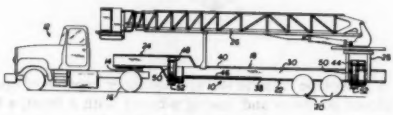
attachment means at both ends of said hanger means for attachment to said support bar said hanger means having a portion thereof adapted to be inserted through a said opening, into the interior of said support bar, and engaging the interior of said support bar adjacent said slot.

4,540,095

COUNTERWEIGHTED AERIAL TRAILER

Robert S. Wormser, and Bruce C. Barton, both of Ocala, Fla., assignors to Federal Motors, Inc., Ocala, Fla.

Filed Feb. 23, 1984, Ser. No. 582,820
Int. Cl.³ B66C *23/72*
U.S. Cl. 212—187 **6 Claims**



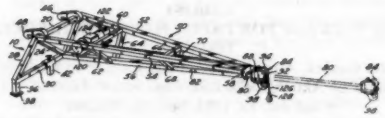
1. A trailer for supporting aerial apparatus comprising, in combination, an elongated frame having a front end, a rear end, lateral sides, an upper portion and a bottom portion, a tractor hitch defined on said frame front end, wheels rotatably mounted on said frame adjacent said rear end, aerial apparatus support means supported on said frame extending above said upper portion, said lateral sides being defined by channel beams having a base and upper and lower legs extending therefrom, said bottom portion comprising a thick metal bottom flat plate affixed to said lower legs, said bottom plate laterally extending beyond said lateral side channel beams when misaligned with respect to said wheels, said channel beams and bottom plate comprising impervious plates defining a receptacle, an initially fluent counterweight within said receptacle confined by said channel beams and bottom plate, and a plurality of reinforcing plates within said frame obliquely extending between and affixed to said channel beams resisting lateral twisting of said frame.

4,540,096

TRUSS BOOM

Victor R. Orvis, 1250 N. Ralston St., Anaheim, Calif. 92801

Filed Aug. 23, 1984, Ser. No. 643,437
Int. Cl.³ B66F *3/36*
U.S. Cl. 212—177 **6 Claims**



1. A truss boom especially constructed and adapted to attach to a lifting machine for extending over and lifting trusses at construction sites, comprising a separable, unitary combination of:

a tetrahedral open space truss formed of six beams, there being three short beams and three longer beams a multiplicity of times longer than the three short beams, the three short beams united at their respective ends together to form a generally equilateral triangle, the proximal ends of each of the longer beams secured to the aforesaid respective unions of the short beams, and the distal ends of each of the longer beams secured substantially together by

distal securing means, said space truss being so constructed and configured that when in use, at least one of the longer beams is in compression, and at least one of the longer beams is in tension;

at least one set of three brace beams intermediate the ends of the longer beams, each of said brace beams being united at their respective ends with the longer beams adjacent one another to form at least one triangular brace structure securing the three longer beams together intermediate the ends thereof;

lifting machine connection means secured to the triangle formed by the union of the short beams of the open space truss, said lifting machine connection means being constructed and adapted to facilitate connection of the open space truss to a lifting machine;

support means secured to the triangle formed by the union of the short beams of the open space truss construction comprising means for supporting said triangle a predetermined distance above a supporting surface when the open space truss is not in use; and

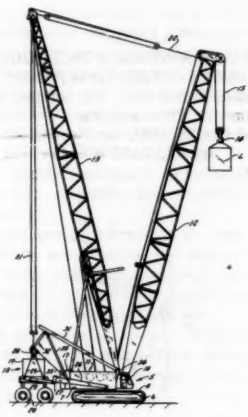
truss connection means secured to the distal securing means for attaching a truss to the truss boom.

4,540,097

CRANE WITH OUTBOARD COUNTERWEIGHT CARRIER

Charles Wadsworth, Escanaba, and Dieter Juergens, Bark River, both of Mich., assignors to Harnischfeger Corporation, Milwaukee, Wis.

Filed Jun. 4, 1984, Ser. No. 617,269
Int. Cl.³ B66C *23/76*
U.S. Cl. 212—196 **3 Claims**



1. A crane of the type comprising a crane base upon which a platform is mounted for swiveling about a vertical axis, rigid upwardly projecting load supporting means on said platform comprising a boom which is normally inclined forwardly and from the top of which a load line depends and a mast behind the boom that is normally inclined rearwardly, a counterweight carrier mounted on wheels and carrying a counterweight, rearwardly extending arm means, pivot means mounting said arm means on said platform for movement about a horizontal axis, forwardly extending arm means fixedly mounted on said counterweight carrier, means pivotally connecting respective adjacent ends of said forwardly and rearwardly extending arms for movement about a horizontal axis whereby said counterweight carrier is maintained in rearwardly spaced relation to the platform and constrained to move horizontally with it but is allowed to move up and down relative to it, and guy means connected with the counterweight carrier and with the tops of the boom and the mast for translating into a lifting force on the counterweight carrier the forward tilting force imposed upon the boom by a load supported by said load line, said crane being characterized by:

means providing a lost motion connection between the counterweight carrier and the platform that allows the counterweight carrier to move relative to the platform up to and down from a predetermined limit at which its said wheels are spaced above the level of the bottom of the crane base, the last mentioned means comprising

a pair of rigid members,

(1) horizontal pivot means connecting one of said member to the counterweight carrier and providing a substantially upwardly facing abutment, and

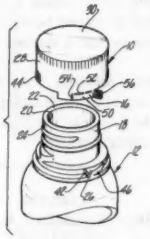
(2) horizontal pivot means connecting the other member of said pair to the platform and providing a substantially downwardly facing abutment that is engaged by said upwardly facing abutment upon movement of the counterweight carrier up to said limit and whereby forces that tend to lift the counterweight carrier above said limit are imposed upon the platform and cable means connected between said platform and counterweight carrier for transferring the lifting forces imposed on the counterweight to said platform in response to engagement of said abutments.

4,540,098

TAMPER INDICATING CHILD RESISTANT CLOSURE

Edward Luker, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

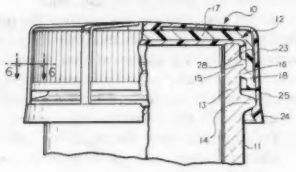
Filed Sep. 28, 1984, Ser. No. 655,232
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—216 **11 Claims**



1. A tamper indicating package comprising: a threaded closure, a container having a threaded neck to receive said closure, a lock member on said threaded neck below the threads and presenting a lock surface facing circumferentially in one direction and a ramp surface adjacent said lock surface and facing in the opposite circumferential direction, said closure including concentric inner and outer walls, a lock tab on said outer wall for engaging said lock surface upon opening rotation of said closure to prevent rotation beyond a predetermined point and being engageable with said ramp surface upon closing rotation to deflect said outer wall to pass said lock member upon rotation in a closing direction, said lock tab being deflectable radially outwardly to pass said lock surface upon radial inward squeezing of said outer wall at diametrically opposed points, a tamper indicating means detachably connected to said outer wall to maintain said lock tab circumferentially spaced from said lock surface in an initial position of said closure, ramp means on said container engageable with said outer skirt at said opposed points to prevent inner radial deflection of said diametrically spaced points when said closure in in said initial position, said tamper indicating element being removable from said closure to permit rotation in an opening direction from said initial position a limited amount to permit deflection of said radially spaced points for removal of

said closure, said removed tamper indicating element giving evidence of possible prior opening.

4,540,099
TAMPER INDICATING PACKAGE
Peter T. Swartzbaugh, Toledo, and Edward M. Hehl, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed May 4, 1984, Ser. No. 607,082
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **10 Claims**



1. A tamper indicating device for a tamper indicating package comprising a container having a neck and a flange on the neck, a closure having a base and a skirt, interengaging means between the closure and the container operable to hold the closure on the container,

said tamper indicating device comprising a plurality of radially extending circumferentially spaced legs having inner ends and outer ends and having portions adapted to extend radially outwardly and axially about the closure,

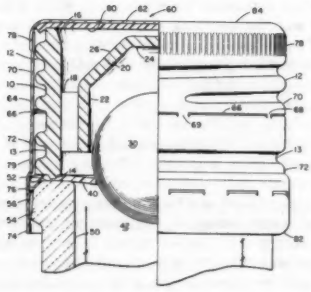
said legs being joined to one another at their inner ends,

an integral annular band joining the outer ends of the legs,

said band adapted to extend beneath the flange of the container when the device is applied over the closure on the container,

said legs being of a material such that the band will move radially inwardly after application of the device to a position beneath the flange of the container thereby providing a tamper indicating device.

4,540,100
DEVICE FOR ATTACHING A FITMENT TO A CONTAINER
W. C. Willis, Hagerstown, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.
Division of Ser. No. 470,477, Feb. 28, 1983, Pat. No. 4,454,954. This application Apr. 5, 1984, Ser. No. 597,024
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **9 Claims**



1. A device for attaching a fitment to an open mouth container and for tamper-evident sealing said fitment attachment thereto, the device comprising:

an end wall;

a first skirt wall portion depending from said end wall and having a portion adapted for rolling a thread projecting inwardly into the device to threadably engage a cooperating threaded portion of said fitment;

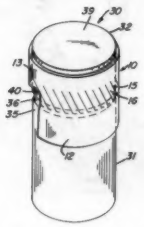
a second skirt portion depending from said first skirt portion and connected thereto by a plurality of circumferentially spaced apart bridges which are adapted to fracture upon disengagement of the threadable engagement with at least one of the bridges having a greater width than any one of a remainder of the plurality of the bridges to thereby insure that at least one of the bridges will remain unbroken when said device is attached to said fitment and said container;

a third skirt portion depending from said second skirt portion;

means in said second skirt portion for providing engagement with said fitment to prevent vertical movement of said second skirt portion; and

means in the third skirt portion for providing engagement with said container to secure said fitment in attached position with respect to said container.

4,540,101
CONTAINER ASSEMBLY INCLUDING A TAMPER-INDICATING BAND
Howard R. Kutcher, Allison Park, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Oct. 26, 1983, Ser. No. 545,444
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **17 Claims**



1. A tamper-indicating band for a container having a neck including a distal finish portion terminating in a rim defining a mouth opening of the container, and a closure overlying the mouth opening and including a skirt engaging the finish portion; said band being formed from paper or foil-covered paper and comprising a single array of obliquely slanted score lines spaced apart from one another, said array extending latitudinally across the entire length of the band and dividing the band into a proximal portion to be fastened to the container and a distal portion to overlie at least a portion of the skirt, said score lines being generally parallel to one another and defining a plurality of obliquely slanted fracturable strips that are uninterrupted by any gaps between adjacent strips; whereby upon fastening said band to the container, said band constitutes a sensitive visual indicator of any attempt to remove the closure.

4,540,102

RESILIENT MATERIAL SCREW TOP FOR CONTAINERS

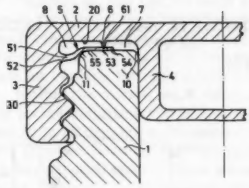
Walter Wiedmer, Am Linthli 2, Näfels, Switzerland

Filed Nov. 14, 1983, Ser. No. 551,363

Claims priority, application Switzerland, Nov. 17, 1982, 6709/82

Int. Cl.³ B65D *53/00*

U.S. Cl. 215—344 **9 Claims**



1. A screw top for use in combination with a container having an opening, a generally annular end surface with a circular outer edge surrounding and adjacent to the opening and a generally cylindrical surface with external thread means around the cylindrical surface, the top comprising

a cap portion;

a generally cylindrical ring portion connected to said cap portion and extending axially therefrom;

internal thread means on said ring portion for threadedly engaging said external thread means to permit screwing on of said top;

a sealing washer extending radially inwardly from said ring portion in a position to contact said annular end surface of said container when said top is screwed thereon,

said washer being spaced from the inner surface of said cap portion above said internal thread means and lying in a plane parallel with said cap portion when said top is apart from said container,

said washer having a maximum thickness significantly smaller than its radial length; and

a generally annular, elastically deformable pressure rib formed on said cap portion and extending axially toward said washer,

said rib being positioned radially between said ring portion and the inner limit of said washer to permit said washer to be axially engaged along a circle between the end of said rib and said annular surface before completion of the screwing-on of said top.

whereby the portion of said washer between the circle of engagement and said ring portion is elongated as said screwing-on is completed, forming a secure seal with said circular edge.

4,540,103

CAP WITH A VALVE UNIT

Joji Kasugai, Ichinomiya, and Akihiro Nakagami, Nishikasugai, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

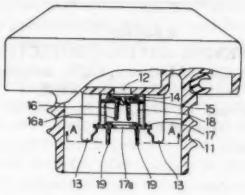
Filed Nov. 28, 1984, Ser. No. 675,703

Claims priority, application Japan, Nov. 29, 1983, 58-224628

Int. Cl.³ B65D *51/16*

U.S. Cl. 220—203 **3 Claims**

1. In a cap with a valve unit wherein a valve body retained in a retainer plate is forcibly fitted into a valve hole formed in a hollow body portion by means of a coil spring, the improvement comprising: a plurality of resilient legs projecting from the underside of the retainer plate on which said valve body is retained and including respective projections projecting outwardly therefrom, a hole formed in a spring retainer plate adapted to retain the coil spring in cooperation with the retainer plate and engageable with the legs and a retainer section



provided in the body portion so as to engage with the edge of the spring retainer plate.

4,540,104

DEVICE FOR SEALING THE FLOATING ROOF OF AN OIL TANK

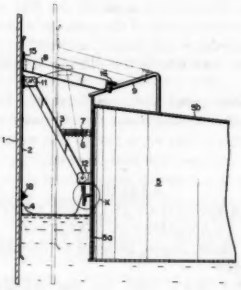
Koichi Kawai, and Minoru Mikuriya, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1984, Ser. No. 594,114

Claims priority, application Japan, Sep. 12, 1983, 58-167859

Int. Cl.³ B65D *88/42, 88/46*

U.S. Cl. 220—224 **2 Claims**



1. A floating roof-type oil-tank sealing device for sealing a space between an outer rim of a floating pontoon and a seal shoe which slides on the inner surface of a tank wall, comprising:

an elongate inclined connector which extends between a lower portion of the outer rim of the floating pontoon and an upper portion of the seal shoe, and pins at both ends of said connector for pivotally supporting the connector ends on the outer rim and the seal shoe;

a compression spring, connected at its ends between said inclined connector and the outer rim of the pontoon, to apply a pressing force to said connector to urge the seal shoe against the tank inner wall;

a seal member provided between the lower portion of the outer rim of the pontoon and that portion of the seal shoe which faces said lower portion, so as to be in contact with the level of stored oil in the oil tank;

guide bar means extending from an upper part of the pontoon; and

a weather hood arranged for sliding movement along said guide bar means, wherein said hood is connected at one edge to an upper end portion of the seal shoe and an opposite edge of said hood slides along said guide bar means when the pontoon moves relative to the tank inner wall, said weather hood being constructed by bending the peripheral edges of a number of rectangular steel plates, and wherein said guide bar means is formed in a rod shape inclined with respect to the upper part of the pontoon, and

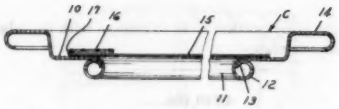
said opposite edge of the weather hood is provided with a U-shaped bolt for slidably engaging the rod-shaped guide bar means.

4,540,105

CLOSURE OPENING HAVING PROTECTIVE BEAD

Philip M. Wright, City of Industry, Calif., assignor to General Can Company, Inc., City of Industry, Calif.

Filed Aug. 13, 1984, Ser. No. 640,134
Int. Cl.³ B65D *41/09*
U.S. Cl. 220—359 **7 Claims**



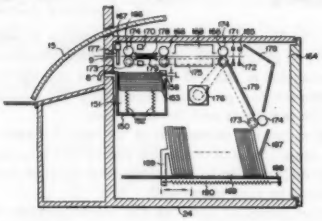
1. A metallic closure for a container comprising
a central panel,
means forming a parting of the panel for attaching the closure to the end of a container to close the end,
said panel having an opening therein,
the portion of the metal adjacent the opening being rolled radially downwardly and outwardly and thereafter radially inwardly with the free edge extending radially inwardly and the portion adjacent the free edge engaging under the inner surface of the panel in a smooth roll such that the free edge is not directly exposed to the contents in the container on which the closure is placed or to the exterior,
and a composite panel having a layer of plastic thermally bonded to the central panel on the outer surface of the central panel.

4,540,106

BAG PROCESSING UNIT OF AN AUTOMATIC TRANSACTION MACHINE

Kunio Fukatsu, Ebina, Japan, assignor to Toshiba Corporation, Kawasaki, Japan

Filed May 5, 1983, Ser. No. 492,033
Claims priority, application Japan, May 6, 1982, 57-75845
Int. Cl.³ B65H *1/08*; G07F *7/10*; G07G *5/00*
U.S. Cl. 221—13 **9 Claims**



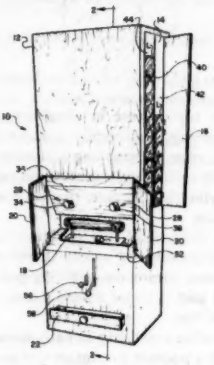
1. A bag processing unit of an automatic transaction machine, comprising:
first means for storing new bags in a pile;
second means, including a manually-operable handle, for removing an uppermost bag in the pile stored in said first means in response to manual operation of said handle;
third means for receiving the bag which is removed by said second means and in which a transaction medium is to be contained;
fourth means for selecting a transaction mode using the bag;
fifth means for precluding the manual operation of said handle; and
sixth means for releasing the precision of the operation of said handle in response to the transaction mode selected by said fourth means and for precluding the operation of said handle of said second means in response to reception of the bag by said third means.

4,540,107

FIREWOOD STORING AND DISPENSING APPARATUS

Richard L. Davidson, 1515 Green Circle Dr., Gastonia, N.C. 28052

Filed Jul. 14, 1983, Ser. No. 513,752
Int. Cl.³ B65H *3/00*
U.S. Cl. 221—194 **19 Claims**



1. Apparatus for storing a quantity of firewood logs or the like and for dispensing said logs individually as desired, comprising a housing, storage means in said housing having a log storage compartment for containing said logs in stacked relation, a log delivery opening in said compartment of a predetermined size adapted for passage therethrough of one said log, and closure means at said log delivery opening selectively movable to restrict and to open said delivery opening to prevent and permit passage of a log therethrough, said closure means including threaded screw means reciprocably movable across said delivery opening selectively to obstruct and to open it, log receptor means adjacent said delivery opening for receiving a log passing therethrough, said receptor means including cradle means for supporting one said log and selectively movable between a log receiving position immediately adjacent said delivery opening and a log dispensing position spaced from said log receiving position, and an access opening in said housing for access to said cradle means at said dispensing position for removal of a log from said cradle means.

4,540,108

NEEDLEPOINTING TOOL

Jeptha E. Campbell, 1618 Dell Ter., Cincinnati, Ohio 45230

Filed May 17, 1984, Ser. No. 611,504
Int. Cl.³ D05C *15/06*
U.S. Cl. 223—102 **16 Claims**

1. A tool for use in grasping yarn during the making of needlepoint with a mesh having openings through which yarn is stitched comprising:

(a) a handle having first and second ends disposed on a longitudinal axis;

(b) a member extending from the first end of the handle along the longitudinal axis; and

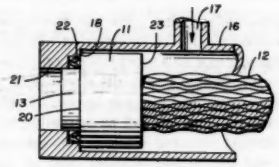
(c) a yarn grasping means joined to an end of the member at a position remote from the first end of the handle, said yarn grasping means having first and second bifurcations extending in the direction of the longitudinal axis, the bifurcations respectively having first and second ends and being joined together at one end to form a vertex for grasping yarn in the vertex, the bifurcations being spaced apart from each other by a substantially constant distance along the longitudinal axis except in proximity to the vertex to form an opening through which yarn can pass for grasping within the vertex, each bifurcation being deflectable to permit deflection toward the other bifurcation when engaging an opening in the mesh to tighten the grasp of yarn disposed between the bifurcations and to spring back to their spaced apart position when not engaging an opening in the mesh, the first and second ends of the bifurcations which define said opening having a taper extending from an outside surface of the bifurcation to the opening to provide a pointed end so that engagement of the tapered end with an opening in the mesh causes the bifurcations to more tightly engage yarn disposed therebetween.

4,540,109

PROCESS FOR SEVERING A TUBE SHEET

Charles J. Runkle, Wake County, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 21, 1983, Ser. No. 553,947
Int. Cl.³ B26F *3/00*
U.S. Cl. 225—1 **7 Claims**



1. A process for severing a brittle polymerie tube sheet to expose bores of hollow fibers having the ends thereof embedded in the tube sheet, said tube sheet having a cylindrical configuration with a rear face and a front face from which said fibers protrude, said rear face having a circular stress raiser extending circumferentially around the axis of the said tube sheet, comprising

(a) supporting the tube sheet at points on the rear face of said tube sheet, said points being arranged in a circle having a diameter greater than the diameter of the stress raiser, and

(b) applying a fluid under pressure to the front face of the tube sheet said pressure being sufficient to stress the tube sheet to the point where a portion of the tube sheet surrounded by the stress raiser fractures off the tube sheet to expose ends of the hollow fibers in the tube sheet.

4,540,110

BONE STAPLER

John H. Bent, deceased, late of Costa Mesa, Calif., and by Paul Bent, executor, Long Beach, Calif., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

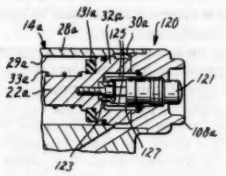
Filed Jun. 28, 1983, Ser. No. 508,588
Int. Cl.³ A61B *17/04*
U.S. Cl. 227—8 **3 Claims**

1. A bone stapler adapted for use with generally U-shaped staples each comprising a central portion and two generally parallel leg portions projecting generally in the same direction from opposite ends of its central portion and having distal ends, said stapler comprising:

a housing having a passageway extending from an inlet opening to an outlet opening, said passageway being adapted to guide a single staple moved from the inlet to the outlet opening with the distal ends of the staple leading;

means for biasing a stack of staples into said inlet opening;

a driver having an end portion adapted to engage the central portion of a said staple and being mounted on said housing for sliding movement between a load position with the driver spaced from the inlet opening to afford movement of one of the staples into the passageway, along said passageway with said end portion pushing the staple, to an eject position at which the end portion of the driver pushes the staple out said outlet opening and at which eject position the driver is stopped by said housing;



drive means adapted to be mutually activatable for rapidly and forcefully propelling said driver along said passageway from said load position to said eject position to move a said staple from said inlet opening to said outlet opening and for returning said driver from said eject to said load position after activation of said drive means; and

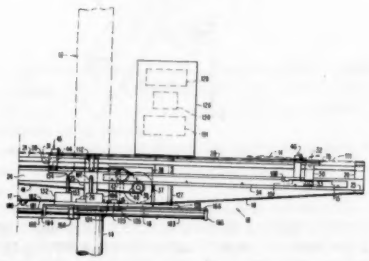
means for releasably latching said driver in said load position comprising latch means adapted for automatic engagement between said housing and said driver when said driver returns to said load position from said eject position, manually activatable button means mounted on said housing for movement from an outer position affording engagement of said latch means to an inner position engaged with and releasing said latch means to afford movement of said driver to said eject position, and means for biasing said button means to said outer position.

4,540,111

ARTICLE TRANSPORT APPARATUS

Volker Schmidt, 4638 Todds Rd., Lexington, Ky. 40509, and Erich A. Schmidt, 2415 Liberty Rd., Lexington, Ky. 40505

Filed Jun. 30, 1983, Ser. No. 509,308
Int. Cl.³ D05B *3/00*; A41H *37/10*
U.S. Cl. 227—8 **27 Claims**



1. An article transport apparatus for positioning various

selected and spaced portions of an article at a fixed location in a selected order including:

support means to support an article having selected and spaced portions for positioning at a fixed location in a selected order;

clamping means to clamp the article on said support means in a fixed relation to a predetermined location on said support means;

moving means to move said support means along a predetermined reciprocating path relative to a fixed location during a cycle of operation;

said clamping means being disposed on said support means for movement with said suport means;

first causing means to cause activation of said moving means;

second causing means to cause inactivation of said moving means when each selected portion of the article to be disposed at the fixed location is disposed at the fixed location by said moving means;

processing means to perform a process on each of the selected portions of the article when the selected portion of the article is disposed at the fixed location and said moving means is inactivated;

said moving means moving said support means during a cycle of operation from its home position in one direction along the predetermined reciprocating path to position at least one selected portion of the article at the fixed location for processing by said processing means, in the opposite direction along the predetermined reciprocating path after said processing means has performed a process on the at least one selected portion of the article to position at least one other selected portion of the article at the fixed location for processing by said processing means, and in the one direction along the predetermined reciprocating path after completion of processing by said processing means to return said support means to its home position;

said clamping means clamping the article on said support means during a cycle of operation to prevent any relative movement between said support means and the article supported thereon until at least completion of processing by said processing means during a cycle of operation;

activating means to activate said first causing means after each of the selected portions of the article has been disposed at the fixed location and subjected to the process by said processing means;

and means to render said clamping means ineffective only after processing by said processing means is completed during a cycle of operation.

4,540,112

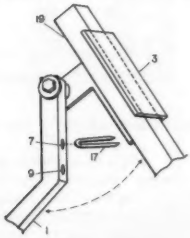
VINE STAPLER

Ed Ewing, 1360 Bennett La., Calistoga, Calif. 94515

Filed Sep. 26, 1983, Ser. No. 535,425

Int. Cl.³ B25C *1/02, 5/00, 5/11*

U.S. Cl. 227—152 **5 Claims**



1. A tool for driving staples into a stake consisting essentially of: a plate bent into a rectangular shape, a handle pivotally mounted on said plate, said plate including a side facing said handle and said handle including a top portion facing said plate, said plate being adapted to be placed around and held against a stake when driving a staple into the stake such that said top portion of said handle facing said plate forces a staple into the stake when said handle is moved forwardly and said plate being bent to a ninety degree angle, one side of said plate including an extension on which said handle is pivotally mounted, the other side of said plate being said side facing said handle.

4,540,113

ULTRASONIC WORKING APPARATUS

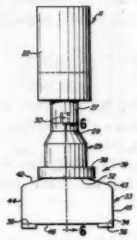
Masahiro Shimazaki, Kobe, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan

Filed May 6, 1983, Ser. No. 492,454

Claims priority, application Japan, May 11, 1982, 57-68936[U]

Int. Cl.³ B29C *27/08*

U.S. Cl. 228—1.1 **21 Claims**



1. In an ultrasonic working apparatus having an ultrasonic vibrator, improved means for transferring vibratory working forces from the vibrator to a workpiece, comprising

a booster horn including a coaxially aligned rod member and plate member, said rod member having one end coaxially coupled to said vibrator, and an opposite end, said plate member having one end coaxially associated with said opposite end of the rod member, and an opposite end provided with distal workpiece engaging means, said plate member having a thickness at said opposite end thereof less than the thickness at said one end thereof and a width at said opposite end thereof substantially greater than the width at said one end thereof, said workpiece engaging means comprising spaced projections at opposite ends of the widthwise extent of said opposite end of the plate member.

4,540,114

APPARATUS FOR SOLDERING WORKPIECES

Heino Pachschwöll, Twistetal-Nieder-Waroldern, Fed. Rep. of Germany, assignor to Zevatron GmbH Gesellschaft fur Fertigungseinrichtungen der Elektronik, Arolsen, Fed. Rep. of Germany

Filed Mar. 29, 1983, Ser. No. 480,057

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212440

Int. Cl.³ B23K *1/08*

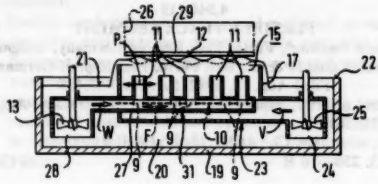
U.S. Cl. 228—37 **31 Claims**

1. Apparatus for soldering workpieces as the workpieces are conveyed past the apparatus along a conveying path in a conveying direction, the apparatus comprising:

a main solder melt having a workpiece contacting surface;

a first solder nozzle fluidly coupled to said main solder melt;

means for varying the angular position of the first solder nozzle relative to the solder melt; and



means for pumping solder through said first solder nozzle to create a generally semi-spherical solder surface in said workpiece contacting surface of said solder melt.

4,540,115

FLUX-FREE PHOTODETECTOR BONDING

Frank Z. Hawrylo, Hamilton Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 28, 1983, Ser. No. 555,586

Claims priority, application United Kingdom, Aug. 26, 1983, 8323065

Int. Cl.[3] **H01L** *21/58;* **B23K** *1/04*

U.S. Cl. 228—123 **9 Claims**

1. A method of soldering a semiconductor device to a heatsink wherein said device has a critical temperature above which it is adversely affected and wherein the solder has a melting temperature above said critical temperature, which method comprises;

heating the heatsink and the solder above the solder melting point;

cooling the liquid solder situate on the heatsink;

introducing the device into the liquid solder under a pressure sufficient to provide uniform heating and wetting of the device by the solder; and

controlling the time span and cooling rate between the device introduction step and the point at which the solder solidifies whereby an acceptable electrical and thermal bond of the device to the heatsink is provided with minimal adverse effects to the device.

4,540,116

BOTTOM FLAP STRUCTURE IN PAPER BOX FOR LIQUIDS

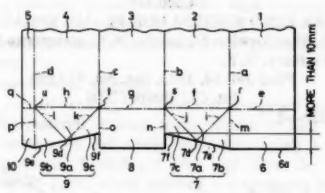
Kiyoshi Shirakawa, Tokyo, Japan, assignor to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,371

Claims priority, application Japan, Jul. 1, 1983, 58-118261

Int. Cl.[3] **B65D** *5/08*

U.S. Cl. 229—38 **1 Claim**



1. A bottom structure and a paper box for storage of liquid, comprising:

first, second, third and fourth bottom panels (**6, 7, 8, 9**) connected to first, second, third and fourth side panels (**1, 2, 3, 4**), respectively, each of said side panels being connected to an adjacent side panel along respective first folding lines (a, b, c), said bottom panels each being connected to said side panels along second folding lines (e, f, g, h) extending from said first folding lines (a, b, c) between the adjacent side panels (**1, 2, 3, 4**), said bottom panels (**6, 7, 8, 9**) being folded along said second folding lines (e, f, g, h) and said first and third bottom panels (**6, 8**) being adapted to be overlapped at end portions thereof with each other for heat-sealing so as to form an outermost bottom portion; and

a connecting portion (**5, 10**) for interconnecting said first and fourth side panels (**1, 4**) and for interconnecting said first and fourth bottom panels (**6, 9**), said second and fourth bottom panels (**7, 9**) being opposed and each including an isosceles triangular innermost portion (*7a, 9a*) to be folded along two of said second folding lines (f, g) and first and second folding-back portions (*7b, 7c;* **9***b,* **9c**) to be folded back along oblique folding-back lines (i, j, k, l) extending from opposite corners (r, s, t, u) of said second and fourth bottom panels (**7, 9**), said bottom structure being formed of the same type of paper on both sides thereof, wherein cut-off edges (*7e, 7f;* **9***e,* **9***f*) of the respective folding-portion (*7b, 7c;* **9***b,* **9c**) pass through an apex of said triangular innermost portions (*7a,* **9***a*), respectively, said cut-off edges (*7e, 7f;* **9***e,* **9***f*) each forming a straight line runningoblique with respect to said second folding lines (e, f, g, h), said bottom panels (**6, 7, 8, 9**) being interconnected by third folding lines (m, n, o, p) and wherein the difference between a length of respective adjacent third folding lines (m, n; o, p) of said second and fourth bottom panels (**7, 9**) is at least 10 mm and the cut-off edge (*6a*) of said first bottom panel (**6**) of said bottom panels (**6, 7, 8, 9**) is parallel to at least one of said second folding lines (f).

4,540,117

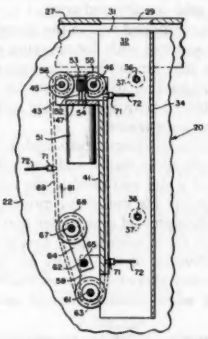
TRANSIT FARE BOX

Brian J. Landry, 1547 Wilson Rd., Macedon, N.Y. 14502

Filed Nov. 16, 1984, Ser. No. 671,999

Int. Cl.[3] **G07B** *15/00*

U.S. Cl. 232—7 **14 Claims**



1. A fare box for transit vehicles and the like, comprising

a housing having a closed upper end containing a slot through which paper currency, such as a dollar bill, is adapted to be inserted,

means defining a vertical chute in said housing beneath said slot for conveying said currency to the bottom of said housing,

said chute having a cross sectional area substantially greater than the cross sectional area of a dollar bill, and large enough normally to permit a folded or rolled bill to drop by gravity through the chute to the bottom of said housing,

chute clearing means projecting part way into said chute from one side thereof, and

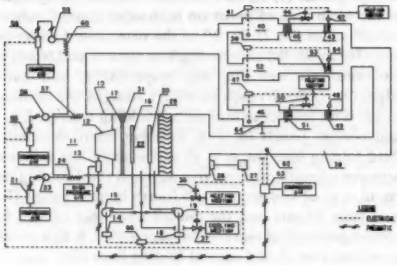
means for repeatedly moving said chute clearing means downwardly in said chute from a point adjacent the upper end thereof to a point adjacent the lower end thereof, thereby to engage and urge downwardly in the chute any object which may have become lodged therein.

4,540,118

VARIABLE AIR VOLUME AIR CONDITIONING SYSTEM

Richard P. Lortie, and William R. Adams, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 11, 1984, Ser. No. 599,074
Int. Cl.[3] B01F *3/02*; G05D *21/00*
U.S. Cl. 236—44 C **14 Claims**



1. A variable air volume air conditioning system for maintaining a conditioned zone at predetermined temperature and humidity levels comprising in combination

(a) a chamber having an entrance end provided with separate modulated damper means for admitting outside air and return air into the chamber and an exit end for delivering conditioned air to a supply air duct carrying conditioned air to said conditioned zone,

(b) spray means positioned within the chamber intermediate the entrance and exit ends for spraying sufficient quantities of water into air moving through said chamber to deliver conditioned air to the supply air duct that is substantially saturated with water vapor and is adjusted to a predetermined temperature,

(c) moisture eliminator means positioned within the chamber intermediate the spray means and said exit end for removing droplets of water entrained in the conditioned air,

(d) variable capacity fan means for moving controlled volumes of air through said system per unit of time,

(e) sensing means for monitoring the dew point of the conditioned air delivered to the supply air duct and control means associated therewith for modulating the damper means which admit outside air and return air into the chamber,

(f) modulated supply air damper means located at the terminus of the supply air duct for admitting conditioned air into said conditioned zone,

(g) heating means disposed in the supply air duct adjacent to the supply air damper means for heating the conditioned air,

(h) temperature sensing means located in the conditioned zone and control means associated therewith for regulating said heating means and modulating said supply air damper means in response to temperature changes in said conditioned zone, and

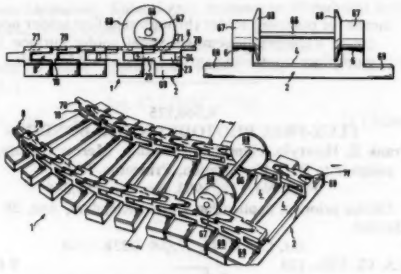
(i) pressure sensing means located in the supply air duct and control means associated therewith for modulating the capacity of said variable capacity fan and for regulating the quantity of water injected into the air by said spray means as the air moves through said chamber.

4,540,119

FLEXIBLE TRACK SEGMENT

Hermann Neuhierl, Fürth, Fed. Rep. of Germany, assignor to Neuhierl GmbH & Co. KG, Fürth, Fed. Rep. of Germany

Filed Aug. 12, 1982, Ser. No. 407,438
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1981, 3132527
Int. Cl.[3] A63H *18/02*; E01B *23/00*
U.S. Cl. 238—10 R **16 Claims**



1. A flexible track segment for carrying freely moving, driven, track-bound toy vehicles comprising:

a plurality of track segment parts each having a travelling surface and first and second oppositely facing sides spaced in the direction of travel of the toy vehicles along the track segment; and

means connecting adjacent track segment parts for universal adjustment relative to each other, including relative vertical and longitudinal shifting between adjacent track segment parts along the direction of travel of the toy vehicle to effect horizontal and vertical curves comprising a locking part projecting from the first side, a receiving part on the first side spaced from the locking part and mating locking and receiving parts on the second side of an adjacent track segment part,

said locking parts comprising a pair of jaws with hook-forming ends which are directed to each other,

said receiving parts comprising an opening in which a pin is arranged vertically to the side of which said receiving part is associated, the outer dimensions of which are smaller than the jaws and larger than the hook-forming ends,

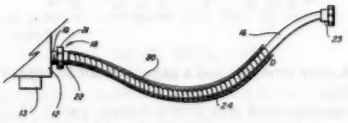
whereby the travelling surfaces on the track segment parts can be arranged relative to each other to derive a desired course for the toy vehicle.

4,540,120

POWDER FEED SYSTEM FOR FLAME SPRAY GUNS

Richard A. Waszkiewicz, Hicksville, N.Y., assignor to METCO, Inc., Westbury, N.Y.

Filed Jul. 14, 1983, Ser. No. 513,595
Int. Cl.[3] B05B *17/00*
U.S. Cl. 239—1 **10 Claims**



1. A powder feed system for flame spray gun comprising, in combination:

a powder feeder including a powder reservoir and a powder metering device both operative to entrain a powder in a carrier gas;

a vibrator;

a flexible conduit for conveying said entrained powder and gas from said metering device to said gun, said conduit having a lowest point disposed between said gun and said metering device;

means to transmit vibrations from said vibrator along said conduit at least to said lowest point of said flexible conduit to cause any non-entrained powder at said lowest point to vibrate.

4,540,121

HIGHLY CONCENTRATED SUPERSONIC MATERIAL FLAME SPRAY METHOD AND APPARATUS

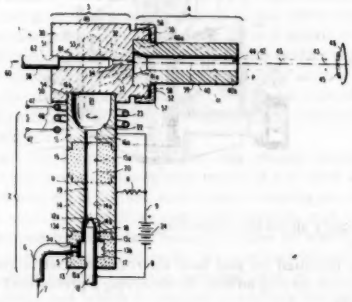
James A. Browning, P.O. Box 863, Hanover, N.H. 03755

Continuation-in-part of Ser. No. 287,652, Jul. 28, 1981, Pat. No. 4,416,421, which is a continuation-in-part of Ser. No. 196,723, Oct. 9, 1980, abandoned. This application Sep. 7, 1983, Ser. No. 530,171

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.³ B05B *7/20*

U.S. Cl. 239—13 **11 Claims**



1. In a flame spray method comprising the steps of:

electrically arc heating, under pressure, a continuous flow of a gas confined to flow within an essentially closed passage,

discharging said heated gas from said passage through a flow expansion nozzle as an extremely hot gas stream, and

feeding material to said stream for high-temperature heat softening or liquifaction and spraying onto a surface positioned in the path of the stream at the discharge end of the nozzle,

the improvement wherein:

the step of feeding said material comprises introducing said material in solid form outside of said electrical heating zone and axially into a converging flow of said electrically heated gas after exit from the electrical heating zone, while entering a converging portion of the flow expansion nozzle having a nozzle bore of a length that is at least five times the diameter of the nozzle bore throat to restrict the diameter of the column of particles passing through said nozzle bore and to prevent build-up of particle material on the nozzle bore wall while insuring sufficient dwell time within the bore to effect particle heat softening or melting.

4,540,122

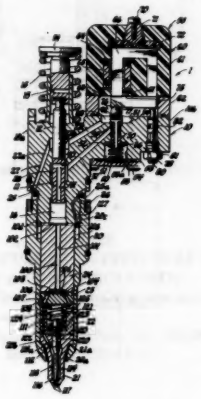
ELECTROMAGNETIC UNIT FUEL INJECTOR WITH PIVOTABLE ARMATURE

Richard F. Teerman, Wyoming, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1983, Ser. No. 545,449

Int. Cl.³ F02M *49/00, 55/00*

U.S. Cl. 239—88 **3 Claims**



1. An electromagnetic unit fuel injector of the type including a pump means to pressurize fuel; a supply/spill passage means in flow communication with said pump means and having a valve operatively associated therewith for movement between an open position and a closed position to control flow therethrough, a spring means operatively associated with said valve to normally bias said valve to said open position and, a solenoid means including a fixed pole piece means and a movable armature operatively associated with said valve to effect movement thereof to said closed position: the improvement wherein said armature is in the form of a rocker arm and includes a first lever arm portion operatively associated with said valve, an intermeidate fulcrum portion pivotally positioned in abutment against a fixed element of said pole piece means and a second lever arm portion, of a length greater than said first arm portion, operatively positioned a predetermined distance from said pole piece means whereby upon energization of said pole piece means, said second lever arm is attracted to said pole piece means to effect movement of said valve to said closed position via said first lever arm, by a force greater than the attractive force applied by the said solenoid pole piece means upon said second lever arm portion as multiplied by the effective respective lengths of said second lever arm portion relative to said first lever arm portion.

4,540,123

ULTRASONIC LIQUID ATOMIZER

Martin Junger, Grafenberg, Fed. Rep. of Germany, and Karl Floegel, I-Besozzo, Italy, assignors to Lechler GmbH & Co. KG, Feilbach, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,259

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1982, 3233901

Int. Cl.³ B05B *17/06*

U.S. Cl. 239—102 **11 Claims**

1. An ultrasonic liquid atomizer, comprising:

(a) piezoelectric transducer means having a preselected resonant frequency;

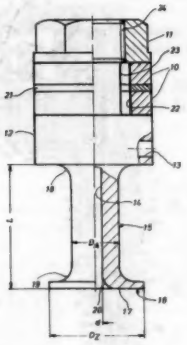
(b) amplitude transformer means having a first end coupled to said transducer means and a second end remote there-

from and a generally tubular portion extending between said ends;

(c) said second end includes a flexural atomizing disk;

(d) said transformer means having a length of at least 1/10 to at most 9/10 of the wavelength of oscillation of said atomizing disk;

(e) said transformer means and said atomizing disk providing an oscillation system having a resonant frequency substantially equal to the resonant frequency of said transducer means;



(f) each of said ends has a diameter exceeding the diameter of said tubular portion;

(g) external transition sections of large radius extend between said ends and said tubular portion for providing low notch-stress for said system;

(h) liquid feed means communicate with said transducer means; and,

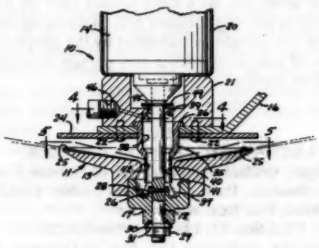
(i) a central bore disposed in said transformer means extends between said ends and communicates with said liquid feed means for permitting liquid to flow from said feed means to said atomizing disk.

4,540,124

ROTARY DISC ATOMIZER

James Haruch, Clarendon Hills, Ill., assignor to Spraying Systems Co., Wheaton, Ill.

Filed Nov. 8, 1982, Ser. No. 439,858
Int. Cl.³ B05B 3/10
U.S. Cl. 239—223 **19 Claims**



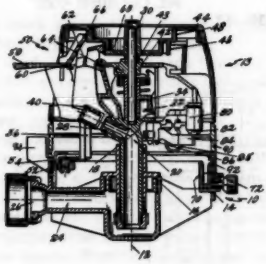
1. A rotary liquid atomizer comprising of a disc mounted for rotational movement about a central axis and defining a fluid dispensing surface that terminates at the outer periphery of said disc, means for rotatably driving said disc, said disc being formed with a central annular fluid supply chamber having an annular discharge opening in communication with said dispensing surface, means extending into said supply chamber for feeding a controlled uniform thin sheet of liquid whirling in a tangential direction such that said liquid accumulates in rapidly moving uniform fashion about the periphery of said chamber, said annular discharge opening having a diameter less than the diameter of said supply chamber such that when liquid accumulates in said supply chamber to the level of said discharge opening the liquid will exit from said discharge opening centrally onto said dispensing surface in a uniform annular flow for movement in the form of a thin film to the outer periphery thereof by centrifugal forces resulting from the rotation of said disc, said dispensing surface of said disc being formed with a plurality of closely spaced radial grooves extending outwardly from the center of said dispensing surface to the peripheral edge thereof for guiding movement of the liquid to said peripheral edge, whereby said liquid film is discharged from said disc in substantially uniform sized droplets.

4,540,125

ROTARY SPRINKLER HAVING SELECTABLE AREA COVERAGE

Moshe Gorney, Kibbutz Naan; Michael Lerner, Rehov Tamar, and Amos Shavit, Kibbutz Naan, all of Israel, assignors to Naan Mechanical Works, Kibbutz Naan, Israel

Filed Apr. 18, 1983, Ser. No. 485,891
Claims priority, application Israel, Apr. 18, 1982, 65516
Int. Cl.³ B05B 3/08
U.S. Cl. 239—232 **28 Claims**



1. A rotary sprinkler comprising:

a base;

a stem mounted on said base for rotation relative thereto, said stem having an inlet for receiving a pressurized water supply;

a water discharge nozzle mounted on said stem and being rotatable together therewith relative to said base;

water driven drive means for rotating said stem relative to said base;

sprinkling pattern determining means including

selectably positionable deflector means for engaging a stream of water emitted by said nozzle for determining the maximum radius of the stream, said deflector means including a first element movably mounted on said stem, a second element defining a water stream engaging portion and a pattern definition cam following element;

predetermined pattern definition cam means operative, in cooperation with said pattern definition cam following element, when said sprinkler is arranged for operation in a first mode of operation to modulate the position of said deflector means in accordance with the azimuthal orientation of the nozzle according to a predetermined pattern;

function selection cam means including manually engageable means for selecting the mode of operation of said sprinkler from among a first mode wherein said pattern definition cam means is operative to modulate the position of said deflector means in accordance with said predeter-

mined pattern and a second mode wherein said pattern definition cam means is not operative to modulate the position of said deflector means.

4,540,126

FUEL INJECTION NOZZLE

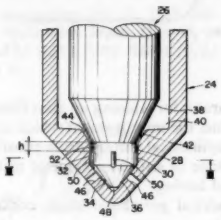
Kenji Yoneda, Atsugi, and Kunihiko Sugihara, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 1, 1983, Ser. No. 519,265

Claims priority, application Japan, Apr. 8, 1982, 57-118592[U]; Dec. 7, 1983, 58-107952[U]

Int. Cl.³ F02M *61/06*

U.S. Cl. 239—533.4 **10 Claims**



1. A fuel injection nozzle comprising:

a hollow nozzle body formed at the tip portion thereof with a conical valve seat and at least one fuel injection orifice having an upstream end located in said valve seat;

a nozzle needle axially movable in said nozzle body and formed at an end with a conical seating surface engageable with said valve seat to provide an initial section between said valve seat and said seating surface for controlling fuel flow through said injection orifice in response to the lift of said nozzle needle; and

means for defining an annular fuel passage between said nozzle body and said nozzle needle at a location upstream of said initial section, said means including an elongated section separate from said initial section, said elongated section having a fuel passage section of which the sectional area is, at the earlier stage of fuel injection, maintained smaller than the sectional area of said injection orifice and which is adapted to prolong the gradual increase in flow to said fuel injection orifice in response to the lift of said nozzle needle.

4,540,127

METHOD AND APPARATUS FOR CRUSHING MATERIALS SUCH AS MINERALS

Uri Andres, Imperial College of Science & Technology, Department of Mineral Resources Engineering, Royal School of Mines, London SW7 2BP, England

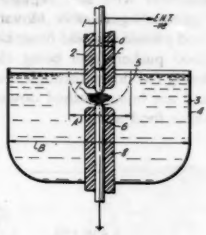
Filed May 23, 1983, Ser. No. 496,999

Claims priority, application United Kingdom, May 21, 1982, 8214926

Int. Cl.³ B02C *19/18*

U.S. Cl. 241—1 **9 Claims**

1. A process for crushing a lump of a material comprising at least two solid phases at least one of which is semi-conductive and of a different conductivity and permitivity to any other phase, which process comprises subjecting the lump immersed in an inert dielectric medium having a substantially higher dielectric constant and higher electric breakdown potential than the lump to the action of an electrical field of a potential between 200 and 800 kV between a pair of opposed electrodes to ionize at least one phase of the lump so that an electrical discharge is caused to pass through the lump, the field and



discharge being localized substantially in the lump whereby the lump is crushed.

4,540,128

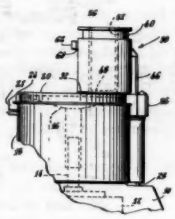
LOCK FOR FOOD PUSHER IN FEED TUBE PROTECTOR OF A FOOD PROCESSOR

John W. Breeden, Westport, Conn., assignor to Cuisinarts, Inc., Greenwich, Conn.

Filed Oct. 24, 1983, Ser. No. 542,340

Int. Cl.³ B02L *18/12*

U.S. Cl. 241—37.5 **6 Claims**



1. In a food processor of the type including a housing containing an electric motor drive and control means for rendering said motor drive inoperative unless said control means is actuated, a bowl mountable on said housing for enclosing a rotatable tool within said bowl drivable by tool drive means when said motor drive is rendered operative by actuation of said control means, a removable cover adapted to be positioned on said bowl with a feedtube mounted on said cover forming a first food passageway for feeding food items through said cover into said bowl, and in which a food pusher can be plunged into said first food passageway for pushing food items toward the rotating tool, a locking means for a feedtube protector comprising:

an outer sleeve nestable in a predetermined position around the exterior of said feedtube;

said food pusher being captured in telescoping relationship with respect to said outer sleeve for enabling said captured food pusher to move longitudinally within said outer sleeve;

said captured food pusher being in alignment with the interior of said outer sleeve for causing said food pusher to become aligned with said first food passageway only when said outer sleeve is nested around said feedtube;

said captured food pusher having a second food passageway for feeding food items through said cover into said bowl adapted to receive a removable food pusher which can be plunged into said second food passageway for pushing food items toward the rotating tool;

said second food passageway being smaller than said first food passageway for accommodating the processing of

smaller food items without removing the feedtube protector from the food processor;

and manually movable locking means mounted on said outer sleeve engageable with said captured food pusher for positively preventing relative movement between said captured food pusher and said outer sleeve to prevent the captured food pusher from being elevated when food items are being fed down through said second food passageway and are being pushed downwardly therein by said removable food pusher.

4,540,129

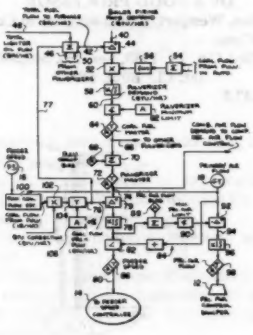
PULVERIZER CONTROL SYSTEM

Allan J. Zadiraka, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 12, 1982, Ser. No. 440,909

Int. Cl.³ B02C *25/00*

U.S. Cl. 241—34 **6 Claims**



1. A pulverizer control system for controlling primary air flow and coal feeder speed to a coal pulverizer comprising:

a feeder controller for controlling feeder speed to vary an amount of coal per unit time supplied to the pulverizer;

a feeder speed transmitter for sensing feeder speed;

a primary air flow controller for controlling flow of primary air to the pulverizer;

a flow transmitter for sensing primary air flow;

a pulverizer coal flow estimator connected to said feeder speed and flow transmitters for calculating a coal flow rate from the pulverizer;

an energy correction unit connected to said estimator for converting said coal flow rate to an energy flow rate;

a first comparator for receiving a rate demand signal in energy per unit time which is desired of the pulverizer and connected to said energy correction unit to generate a first error signal;

a first proportional-plus-integral unit connected to said first comparator for generating a first pulverizer demand signal, said first proportional-plus-integral unit connected to said feeder controller for controlling the feeder speed according to said first pulverizer demand signal;

a further comparator connected to said first proportional-plus-integral unit and to said flow transmitter for generating a flow error; and

a further proportional-plus-integral unit connected to said further comparator for generating an air flow demand signal, said further proportional-plus-integral unit connected to said flow controller for controling the primary air flow according to said air flow demand signal.

4,540,130

DRUM FOR WINDING FILAMENTARY MATERIAL

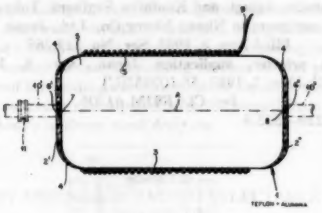
Giorgio Grego, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

Filed May 11, 1984, Ser. No. 609,188

Claims priority, application Italy, May 11, 1983, 53304/83[U]

Int. Cl.³ B65H *54/54, 75/24*

U.S. Cl. 242—18 G **3 Claims**



1. In an apparatus for winding up glass filaments and tensionally testing same, the improvement which comprises:

a generally cylindrical unitary drum constituted as an inflatable envelope of airtight polymeric material centered on an axis and having:

thin cylindrical peripheral walls coaxially surrounding said axis,

a pair of relatively thick end walls lying in planes perpendicular to said axis and spaced apart along said axis with said peripheral wall located between them, and

convex annular transition zones merging each of said end walls into said peripheral wall;

respective coaxial formations on said end walls;

respective shafts connected to said formations for rotatably supporting said drum and driving same in rotation about said axis; and

valve means on one of said end walls for maintaining a selected internal pressure within said drum in excess of ambient pressure for entrainment of said filaments to draw them onto said drum.

4,540,131

ROLLED SHEET PAYING OUT TRANSFER APPARATUS

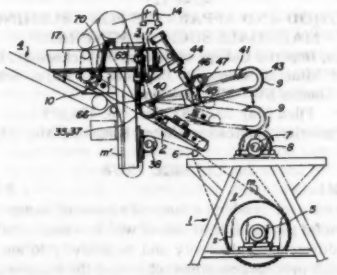
Ryutaro Ishii, Mitaka, and Yuichiro Ogawa, Fuchu, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 561,112

Claims priority, application Japan, Dec. 14, 1982, 57-217725

Int. Cl.³ B29H *17/00, 17/10, 17/20*

U.S. Cl. 242—55 **15 Claims**



1. A rolled sheet paying out transfer apparatus comprising a support frame for supporting a rolled sheet having a liner interposed between turns of the rolled sheet so as to paying out

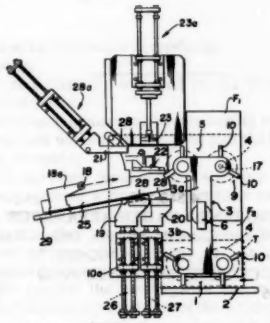
said sheet by winding up said liner, intermediate conveyor means for holding on an underside portion thereof said paid sheet separately from said liner with the aid of an attractive force and introducing said sheet toward delivery conveyor means, and pushing-down roller means for pushing down said sheet at a termination of said intermediate conveyor means so as to transfer the sheet from the underside of said intermediate conveyor means onto an upper surface of said delivery conveyor means.

4,540,132

APPARATUS FOR WINDING VIDEO TAPE ON REELS OF A CASSETTE

Yoshiharu Kubo, Tokushima, Japan, assignor to AWA Engineering Co., Ltd., Tokushima, Japan

Continuation-in-part of Ser. No. 450,545, Dec. 16, 1982, abandoned. This application Jun. 15, 1984, Ser. No. 622,059
Claims priority, application Japan, Dec. 16, 1981, 56-204433
Int. Cl.³ B23Q *7/00*; B65H *19/22*
U.S. Cl. 242—67.1 R **4 Claims**



1. An apparatus for feeding pairs of reels to a winding position in a winding apparatus for winding video tape on the reels and removing the loaded reels from the winding apparatus, comprising:

a feeding means for feeding trays carrying a pair of empty reels removably mounted in the trays to a transfer area, and carrying trays into which pairs of loaded reels have been placed away from the transfer area;

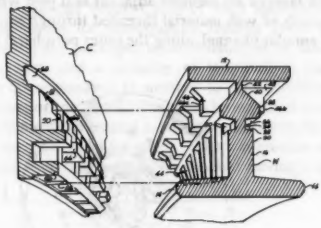
a rotating arm means rotatably mounted adjacent said feeding means for transferring a pair of reels from a tray at the transfer area to the winding position and another pair of reels having tape wound thereon from the winding position to the transfer area, said rotating arm being rotatable about a point between the transfer area and the winding position and in a plane including the transfer area and the winding position and being movable axially, means for rotating said rotating arm means and reciprocally moving said rotating arm means axially of the axis of said rotation shaft, said rotating arm means having a plurality of arms extending radially from said rotation shaft, each of said arms having on the free end a holding member means for gripping a pair of reels while said rotating arm means is moved axially for removing the reels from a tray, holding the reels while said rotating arm means is rotated and while the reels are placed on the winding apparatus in the winding position as said rotating arm means is moved axially, for gripping reels in the winding position while said rotating arm means is moved axially for removing the reels from the winding apparatus, holding the reels while the rotating arm means rotates and while the reels are placed in the trays as said rotating arm means is moved axially.

4,540,133

TAPE REEL AND METHOD

Lawrence C. Alsobrook, Auburn, Ala., assignor to Data Technology Corporation, Opelika, Ala.

Filed Oct. 24, 1984, Ser. No. 664,370
Int. Cl.³ B65H *75/18*
U.S. Cl. 242—71.8 **39 Claims**



1. A magnetic tape reel comprising:

a central annular hub;

a tape winding ring carried by said hub on which said magnetic tape is wound;

a spindle mounting ring carried by said hub adapted for mounting said reel to a spindle of an associated machine;

a web extending between said mounting ring and said winding ring;

a support shoulder extending across said web defining opposing shoulder sides on opposing sides of said web;

a generally Y-shaped crossarm carried by said shoulder for supporting said tape ring on said hub;

a widened web extension extending laterally beyond said web and tranverse thereto, and said web extension extending vertically between said mounting ring and said shoulder;

a plurality of web recesses formed in said web around a circumference of said cental hub;

a back flange carried by said hub;

a front flange carried by said hub at a side thereof opposite said back flange;

said back flange including a ledge surface for receiving one side of said shoulder of said hub;

said back flange including web recess engaging means carried below said ledge surface for engaging said recesses of said web;

said front flange including a ledge surface for receiving an opposing side of said shoulder of said hub; and

said front flange further including a lower mounting base surface abutting said mounting ring of said hub for attachment.

4,540,134

FILM CORE WITH RESTRAINER

Martin Schankler, 12 New Dover Rd., East Brunswick, N.J. 08816

Filed Feb. 13, 1984, Ser. No. 579,444
Int. Cl.³ B65H *75/28*
U.S. Cl. 242—74 **7 Claims**

1. An improved core for storing web material comprising:

a cylinder having an axis of rotation and an axially extending slot for receiving web material;

a rectangular collar within said cylinder and substantially concentric with said cylinder about said axis of rotation thereby forming an annular channel between the outer peripheral surface of said rectangular collar and the inner surface of said cylinder, said annular channel communicating with said axial slot;

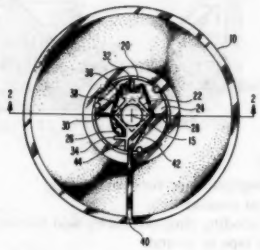
spacing means between said cylinder and rectangular collar to maintain said cylinder and collar in fixed substantially concentric relation;

first, second, and third tapered rib members for positioning said web material within said annular channel said rib members being spaced ninety degrees apart from each other;

a channelled wall member mounted on said rectangular collar opposite a tapered rib member;

a post within said annular channel and substantially adjacent to said rectangular collar;

a fourth tapered rib member adjacent said post whereby the labyrinth of web material threaded through said slot into said annular channel, along the outer peripheral surface of



said rectangular coller, adjacent a first tapered rib member, between a second tapered rib and said channelled wall member, adjacent a third tapered rib member, around said post and adjacent said fourth tapered rib member, back through said channel and out said slot, is securely restrained by means of the cooperative action of the restraining effect of said post and channelled wall member on the web material, the extended frictional contact between the resulting two layers of web material and the frictional engagement of the web material about the outer peripheral surface of said rectangular collar, notwithstanding pulling forces applied to the web.

4,540,135

DEVICE FOR CONTROLLING A CLICK BRAKE ON A FLY REEL

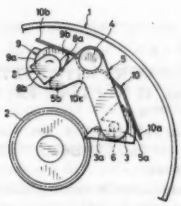
Haruo Uetsuki, and Takehiro Kobayashi, both of Hiroshima, Japan, assignors to Ryobi Ltd., Japan

Continuation of Ser. No. 364,696, Apr. 2, 1982, abandoned. This application Jul. 27, 1984, Ser. No. 635,465

Claims priority, application Japan, Apr. 6, 1981, 56-49871[U]

Int. Cl.[3] A01K *89/02*

U.S. Cl. 242—84.51 R **10 Claims**



1. A click brake control device for a fly reel having a spool and an associated click gear, said control device comprising:

a pawl;

a pawl holder slidably supporting said pawl at one end of said pawl holder and including a cam-engaging surface at the other end of said pawl holder, said pawl holder being pivotably supported at a position intermediate said one and other ends thereof;

a spring for biasing said pawl toward said click gear and including a cam-engaging surface at one end thereof; and

a cam assembly including a first cam member for moving said pawl into and out of engagement with said click gear, said first cam member being rotatable about a common axis and disposed between said cam-engaging surfaces of said pawl holder and spring, said first cam member urging said cam-engaging surface of said pawl away from said common axis in order to move said pawl out of engagement with said click gear, and a second cam member for varying the force exerted by said spring on said pawl when said pawl engages said click gear to thereby vary the braking force on said spool, said second cam member being disposed between said cam-engaging surfaces of said spring and pawl holder and in a different plane from said first cam member, said second cam member being rotatable in said different plane about said common axis to urge said cam-engaging surface of said spring away from said common axis in order to increase the force exerted by said spring on said pawl.

4,540,136

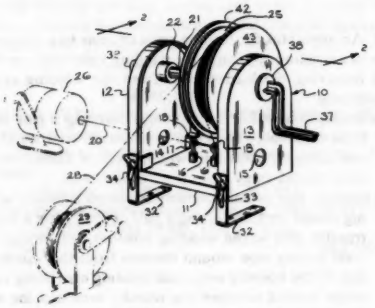
FISHING LINE LOADER APPARATUS

William H. Rauch, 640 Glendale, Deshler, Ohio 43516

Filed Jun. 11, 1984, Ser. No. 619,773

Int. Cl.[3] B65H *49/00;* **A01K** *89/00*

U.S. Cl. 242—106 **8 Claims**



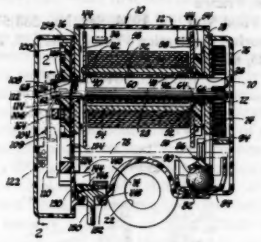
1. A fishing line loader comprising, in combination, a base, opposed sidewalls extending upwardly from said base, a shaft mounted for rotation between said sidewalls, whereby a fishing line spool may be mounted for rotation on said shaft, at least one disk mounted on said shaft adjacent such fishing line spool, and an elastomeric bearing on said shaft adjacent said disk for urging said disk against such fishing line spool, whereby such fishing line spool has restricted rotation relative to said shaft, guide means on said base for transporting fishing line from or to such fishing line spool in a direction parallel to said shaft, a crank on one end of said shaft and clutch means for operatively connecting said crank to said fishing line spool, said clutch means including at least one drive rod for engaging said fishing line spool said disc defining at least one drive opening for the rection of said drive rod, whereby upon rotation of said crank said drive pin engages and rotates such fishing line spool.

4,540,137

INERTIA RELEASE FOR BELT RETRACTOR WINDING PREVENTION MECHANISM

Lloyd W. Rogers, Jr.; Regis V. Pilarski, both of Utica, and Thomas B. Blake, Fraser, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1984, Ser. No. 646,421
Int. Cl.[3] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.6 3 Claims



1. A seat belt retractor comprising:
a housing;
a belt reel rotatably mounted on the housing and having ratchet teeth;
a windup spring imposing a force urging rotation of the reel in the belt winding direction to pull the belt taut against a seat occupant;
a pawl movably mounted for selective engagement and disengagement with the ratchet teeth to block belt winding rotation by resisting the force imposed by the windup spring so that the belt is held in a slackened condition about the occupant;
a collapsible support mechanism carrying the pawl to normally support the pawl against movement by force imposed thereon by the effort of the windup spring when the pawl is engaged with the ratchet teeth carried by the reel;
inertia means acting in response to the occurrence of a predetermined level of vehicle deceleration to trigger a collapse of the collapsible support mechanism so that the pawl is shifted relative the housing by the force imposed thereon by the effort of the windup spring; and
means acting to move the pawl out of engagement with the ratchet teeth in response to shifting movement of the pawl to thereby enable further belt winding rotation of the reel by the windup spring to pull the belt taut against the seat occupant.

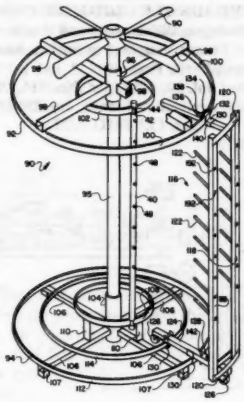
4,540,138

TEXTILE YARN CREEL

Alan Gutschmit, Troy, N.C., assignor to Alandale Knitting Company, Troy, N.C.

Filed Apr. 9, 1984, Ser. No. 598,266
Int. Cl.[3] B65H *49/02*; D02H *1/00*; D03J *5/08*
U.S. Cl. 242—131 35 Claims

16. A textile yarn creel for compactly and adjustably supporting diverse pluralities of yarn packages for feeding yarn therefrom to a textile knitting machine or like textile apparatus, comprising a pair of circular frame members each having a outer circular element and a concentric inner circular element, said frame members being disposed in spaced apart coaxially parallel relationship, a plurality of longitudinal yarn package supporting means adapted to be mounted on said outer circular elements to extend axially therebetween for selective removal therefrom and for selective circumferential disposition and movement thereabout, each said yarn package supporting means having two identical sets of plural package support pins spaced transversely of the length of said yarn package supporting means with said pins of said two sets being correspondingly spaced along said yarn package supporting means and extending outwardly therefrom to extend generally radially inwardly of said outer frame elements when mounted thereon, a selected number of said yarn package supporting means being mounted on said outer frame members at selected circumferential spacings and locations for supporting a selected number of primary yarn packages on one set of said package support pins of each said yarn package supporting means for initially feeding yarns from said primary yarn packages and for supporting a corresponding number of replacement yarn packages on the other set of said package support pins of each said yarn package supporting means for subsequently feeding yarns from said replacement yarn packages upon exhaustion of said primary yarn packages, and a plurality of longitudinal yarn eyelet members corresponding in number to said plurality of yarn package supporting means adapted to be mounted on said inner circular elements to extend axially therebetween for selective removal therefrom and for selective circumferential movement thereabout, each said yarn eyelet member having a set of yarn



eyelets spaced therealong corresponding in number and spacing to one said set of package support pins for facing generally radially outwardly of said inner circular elements when mounted thereon, a selected number of said yarn eyelet members corresponding to said selected number of said yarn package supporting means being mounted on said inner circular elements at selected circumferential locations and spacings to be respectively positioned circumferentially intermediate said two sets of said package support pins of said yarn package supporting means for receiving said yarns of said primary and replacement packages supported thereon along radially inward yarn traveling paths in substantially identical fashion from both said primary and replacement yarn packages for feeding of said yarns to said textile apparatus, whereby said creel is adjustably adapted for selectively supporting diverse pluralities of yarn packages for yarn feeding operation in a compact circular area defined by said circular frame members.

4,540,139

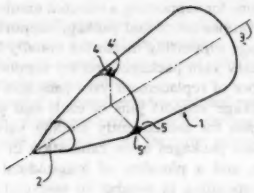
PASSIVE MISSILE HOMING SYSTEM

Pierre Levy, Boulogne-Billancourt, and André Robert, Eaubonne, both of France, assignors to Societe Anonyme de Telecommunications, France

Filed Jul. 20, 1983, Ser. No. 516,118
Claims priority, application France, Jul. 27, 1982, 82 13108
Int. Cl.[3] F41G *7/22*
U.S. Cl. 244—3.19 4 Claims

1. A passive homing system for missiles, comprising at least three interferometric bases each having two electromagnetic

antennae disposed on the missile, characterized in that said three interferometric bases have respective mid-perpendicular



planes which are inclined two by two at 120° with respect to each other.

4,540,140

PASSIVE MISSILE GUIDANCE PROCESS

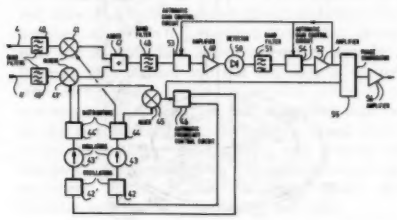
Pierre Levy, Boulogne Billancourt, and André Robert, Eaubonne, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Jul. 20, 1983, Ser. No. 516,120

Claims priority, application France, Jul. 28, 1982, 82 13188

Int. Cl.³ F41G *7/22*

U.S. Cl. 244—3.19 **5 Claims**



1. Process for passive guidance of a guided missile to a target, in which, over at least part of its path, the missile is guided by a passive electromagnetic guidance, wherein, on said part of its path, the missile is guided by maintaining constant the angular variation (α) between its velocity vector (V) and a straight line (R′) passing through the missile (E) and a projection (C′) of the target (C) on the earth's globe (S).

4,540,141

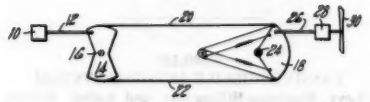
FAIL-SAFE TAIL ROTOR CONTROL SYSTEM

Ronald A. Durno, Trumbull, Conn., and Rudolph F. Huber, Jupiter, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 22, 1983, Ser. No. 534,891

Int. Cl.³ B64C *13/30*

U.S. Cl. 244—17.19 **9 Claims**



1. In a flight control system for the tail rotor of a helicopter, a partially circular member rotatable about a center axis and having flexible cables for rotating said member about said axis wrapped entirely about and connected to opposite sides of said member and extending therefrom in the same essentially parallel direction and spring means extending from each cable at its connections with said member, each spring means being wrapped around pulley means spaced from said member and located between said cables, the end of each spring means being attached to said member on the same side of said center axis as its cable member connection.

4,540,142

NOSE-WHEEL TYPE LANDING GEAR FOR AIRCRAFT

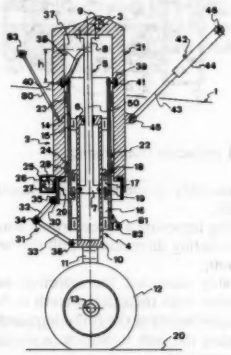
Jacques Veaux, Chatillon, and Michel Derrien, Versailles, both of France, assignors to Messier-Hispnao-Bugatti (S.A.), Montrouge, France

Filed Mar. 12, 1984, Ser. No. 588,572

Claims priority, application France, Mar. 25, 1983, 83 04915; May 31, 1983, 83 08966

Int. Cl.³ B64C *25/10*

U.S. Cl. 244—102 R **20 Claims**



1. A nose-wheel type landing gear for aircraft, comprising:
a shock absorber including a rod and a cylinder, said rod being slidable in said cylinder, and having a projecting end connected to a fixed point on the aircraft structure;
running means connected to the other end of said shock absorber;
a guide sheath substantially around said shock absorber;
sliding bearings between the inside wall of said sheath and the outside wall of said cylinder;
releasably engageable means for connecting said cylinder to said sheath, at least in rotation, when said shock absorber is in a "relaxed" position;
a strut surrounding said sheath;
controllable means for exerting a traction force on said sheath to draw said sheath into said strut; and
means for causing said sheath to rotate as it is drawn into said strut.

4,540,143

NACELLE/WING ASSEMBLY WITH WAKE CONTROL DEVICE

Timothy Wang, and Thomas A. Zierten, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 4, 1983, Ser. No. 520,826

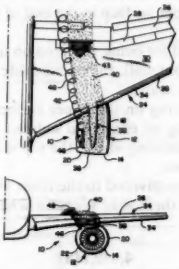
Int. Cl.³ B64C *23/06*; B64D *29/02*

U.S. Cl. 244—130 **19 Claims**

1. In a nacelle and wing combination, where said wing is swept and has a leading edge, a trailing edge, an upper surface and a lower surface, said nacelle being mounted below and forwardly of the leading edge of the wing, said nacelle having an outside surface and having a forward portion extending forwardly of said wing leading edge and a forward inlet lip with an upper lip portion, the forward portion of the nacelle comprising a front third portion, a middle third portion, and a rear third portion, said wing having a first forward swept portion extending laterally and forwardly from said nacelle

and a second rear swept portion extending laterally and rearwardly from said nacelle, said nacelle having first and second side portions adjacent said first and second wing portions, respectively, said wing and nacelle combination being characterized in that in a wing and nacelle alone configuration, with the wing in a high lift configuration and in a high lift/high angle of attack mode of operation, flow separates from said upper lip portion to form a highly turbulent wake which passes over the wing leading edge with said wake having first and second side edge portions at said first and second wing portions, respectively, said wake first side edge portion expanding laterally and rearwardly across said first forwardly swept wing portion so as to reduce lift,

an improvement which is a wake control means located on said nacelle surface adjacent the first edge portion of the wake, said wake control means comprising a forward vortex generating portion extending outwardly from said nacelle surface and positioned rearwardly of said inlet lip of the nacelle, and a second fence portion positioned rearwardly of said vortex generating portion and extending lengthwise in said middle third portion of the nacelle, said forward vortex generating portion functioning primarily to initially generate a vortex which travels rearwardly and over said wing leading edge, and said fence portion controlling boundary layer air which flows upwardly and rearwardly along said nacelle first side surface portion so as to direct some of said boundary layer air away from said wing leading edge portion which is proximate to an upper part of said nacelle first side surface portion, and to energize other portions of said boundary layer air whereby said vortex becomes properly positioned adjacent the first side edge portion of the wake to limit expansion of the first side edge portion of the wake over the wing.



13. A method of designing and building a nacelle and wing combination, where said wing is swept and has a leading edge, a trailing edge, an upper surface and a lower surface, said nacelle being mounted below and forwardly of the leading edge of the wing, said nacelle having an outside surface and having a forward portion extending forwardly of said wing leading edge and a forward inlet lip with an upper lip portion, the forward portion of the nacelle comprising a front third portion, a middle third portion, and a rear third portion, said wing having a first forward swept portion extending laterally and forwardly from said nacelle and a second rear swept portion extending laterally and rearwardly from said nacelle, said nacelle having first and second side portions adjacent said first and second wing portions, respectively,

(a) determining whether a turbulent wake condition exists, when, with said wing and nacelle combination in a wing and nacelle alone configuration, with the wing in a high lift configuration and in a high lift/high angle of attack mode of operation, flow separates from said upper lip portion to form said highly turbulent wake which passes over the wing leading edge with said wake having first and second side edge portions at said first and second wing portions, respectively, and said wake first side edge portion expands laterally and rearwardly across said forwardly swept wing portion so as to reduce lift,

(b) determining location of said first side edge portion of the wake as the wake leaves the upper lip portion at a forward part of said nacelle,

(c) mounting a vortex generating means to the nacelle rearwardly of said lip and adjacent to said first side edge portion at a location to generate a vortex which travels rearwardly over the leading edge of the wing,

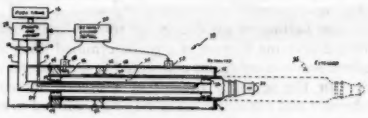
(d) mounting a fence rearwardly of the vortex generating portion in the middle third portion of the nacelle side surface rearwardly of said vortex generating portion at a location to control boundary layer flow rearwardly and upwardly along the first side portion of the nacelle so as to position said vortex properly adjacent the first side edge portion of the wake and limit expansion of the first side edge portion of the wake over the wing.

4,540,144

TELESCOPING FUEL PROBE

Andrew P. Perrella, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 5, 1984, Ser. No. 568,459
Int. Cl.³ B64D *39/02*
U.S. Cl. 244—135 A **5 Claims**



1. A telescoping fuel probe comprising;

a main fuel line for providing fuel to the probe to extend the probe and for receiving fuel from the probe;

a secondary fuel line for providing fuel to the probe to retract the probe;

a check valve;

a stationary inner tube, connected at one end to the main fuel line and terminating at the other end in a first flange having an outside diameter larger than the outside diameter of the inner tube;

a movable outer tube disposed about the inner tube and having an inside diameter that corresponds to the outside diameter of the first flange, connected at one end to the check valve so that fluid can enter the outer tube through the check valve, but cannot exit the outer tube through the check valve, and terminating at the other end in a second flange that has an inside diameter that is smaller than the inside diameter of the outer tube, wherein the inside diameter of the second flange corresponds to the outside diameter of the inner tube; and

a retraction chamber defined by the inner tube, the outer tube, the first flange, and the second flange, said retraction chamber in fluid communication with the secondary fuel line.

4,540,145

REEFING SYSTEM

Jon T. Matsuo, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

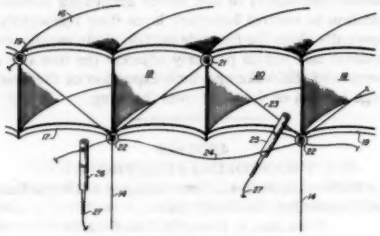
Filed Aug. 27, 1984, Ser. No. 644,603
Int. Cl.³ B64D *17/62*
U.S. Cl. 244—152 **11 Claims**

1. In a ram-air parachute wing having a canopy having an upper and a lower support surface attached to and separated by a plurality of ribs shaped to form said upper and lower wing surfaces into an airfoil configuration, an improved reefing system comprising:

a first plurality of attachment means connected to said upper support surface at spaced points about the leading edge of the parachute wing thereof;

a second plurality of attachment means connected to said lower support surface at spaced points about the periphery of the parachute wing thereof;

a first reefing line connecting individual ones of said first plurality of attachment means with individual ones of said second plurality of attachment means in a predetermined pattern;



a second reefing line connecting individual ones of said second plurality of attachment means in a predetermined pattern;

a first line cutting means connected to said first reefing line for the severing thereof at a predetermined time; and

a second line cutting means connected to said second reefing line for the severing thereof at a predetermined time, whereby said parachute wing may be deployed to open in stages so as to facilitate parachute development at relatively higher airspeeds than parachute wings of a similar type bereft of such a reefing system.

4,540,146

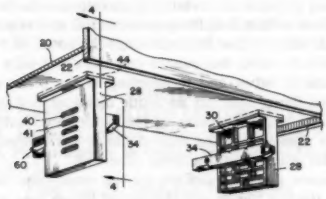
MOUNTING ARRANGEMENT

Peter A. Basile, Hudson, Ohio, assignor to Black & Decker, Inc., Newark, Del.

Filed Aug. 29, 1983, Ser. No. 527,126

Int. Cl.³ A47B *57/02*

U.S. Cl. 248—201 **6 Claims**



1. A vertically adjustable locking mounting arrangement for a box-like structure securing the structure to an overhead support comprising,

a horizontal channel in each vertical end wall of the box structure,

a pair of spaced identical brackets opposite the channels to secure to said support,

each bracket having a rail-like horizontal hanger removably secured thereon,

said hangers formed to slidingly nest in said channels carrying said structure on said support,

releasable means locking each hanger to its bracket in selected vertical positions and locking said hanger in said channels to variably and releasably vertically position said structure on said support,

each identical bracket being formed as an open face tray with a plurality of equally spaced honeycomb cells therein and secured to said support facing the opposite bracket, and

each hanger having a plurality of protrusions releasingly and lockingly nesting in said cells for support on said bracket in selected vertical positions.

4,540,147

JACK STAND ATTACHMENT

William R. Lincourt, 54 E. Bowery St., Newport, R.I. 02840

Filed Sep. 23, 1983, Ser. No. 535,280

Int. Cl.³ E04G *25/00*

U.S. Cl. 248—352 **1 Claim**

1. A jack stand attachment for use with a conventional support stand of the type which includes a multi-legged base having a shaft reciprocal in the base and a load rest having a substantially flat upper surface at the end of the shaft comprising,

socket means sized for being received on top of the load rest, and having a front wall, an opposite side wall, a pair of end walls and a top wall;

a V-shaped rest lying on the upper surface of the top wall, said rest defining an elongated saddle,

said front wall extending above the top wall and supporting the V-shaped rest,

a pair of link means pivoted to the front wall with apertures in the terminus thereof to accept a wheel lug bolt.

4,540,148

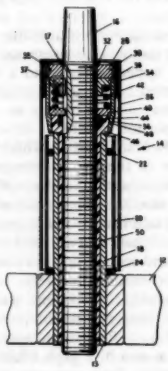
CHAIR HEIGHT ADJUSTMENT MECHANISM

James M. Jann, 1650 Glenforest, Ada, Mich. 49301

Filed Nov. 10, 1983, Ser. No. 550,625

Int. Cl.³ F16M *11/00*

U.S. Cl. 248—406.2 **15 Claims**



1. In a chair height adjustment mechanism wherein a nut is threaded onto a threaded spindle, a clutch selectively couples the nut to a hub tube for adjusting the axial height of the spindle with respect to the hub tube and means bias the clutch

into engagement relationship between the hub tube and the nut so that the spindle is adjustable with respect to the hub tube when a chair attached to the spindle is unoccupied and the clutch is disengaged so that the relationship between the hub tube and the spindle is not adjustable when the chair is unoccupied;

the improvement in the clutch which comprises:

a cylindrical locking tube secured to said nut and extending downwardly thereof, a portion of said locking tube forming an inwardly tapering locking surface beneath said nut;

said hub tube including a cylindrical wedge member telescopingly received within said locking tube, said wedge member having a flared outer surface complementary to said tapered locking surface;

wherein slight upward movement of said wedge member with respect to said locking tube disengages said clutch and said clutch is engaged by slight downward movement of said wedge member with respect to said locking tube.

4,540,149

STAND FOR A DRILLING TOOL

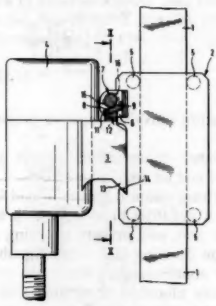
Hans Rupprecht, Munich, and Franz Hoyss, Bad Tölz, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Fed. Rep. of Germany

Filed Oct. 6, 1983, Ser. No. 539,533

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3237057

Int. Cl.³ F16B *7/02*

U.S. Cl. 248—669 **4 Claims**



1. Stand for drilling tool comprises an elongated support column, a carriage mounted on and displaceable in the elongated direction of said support column, a carrier member for a drilling tool, said carrier member removably mounted on said carriage, said carrier member has support sections thereon including a first support section, said carriage has support surfaces spaced apart in the elongated direction of said column and engageable with said support sections for supporting said carrier member on said carriage, said support surfaces include an axially extending eccentric peg rotatably mounted about the axis thereof on said carriage for engagement with said first support section on said carrier member, said eccentric peg extends transversely of the elongated direction of said column, said eccentric peg has an axially extending outside surface with an eccentric surface thereon extending in the circumferential direction about the axis of said peg and in the axial direction of said peg, said eccentric surface being rotatably displaceable between engagement with and disengagement from said first support section, said first support section having a support surface extending transversely of the elongated direction of said column and a catch projection spaced laterally from the axis of said peg and extending outwardly from said support surface on said first support section in the direction towards said peg for a dimension so that, with said eccentric surface of said peg located opposite and co-extensive with said support surface on said first support section, said projection prevents the removal of said carrier member out of supporting contact with said carriage, and said peg being axially displaceable relative to said support surface on said first support section so that when said peg is displaced axially out of coextension with said support surface on said first support section said carrier member can be removed from said carriage.

4,540,150

SELF ELEVATING FORMWORK INSTALLATION WITH VARIABLE GEOMETRY FOR MAKING CONCRETE SURFACES, PARTICULARLY VERY HIGH CONCRETE SURFACES

Alexandre Tzincoca, Paris, France, assignor to Entreprise Generale Industrielle, Noisy-le-Grand, France

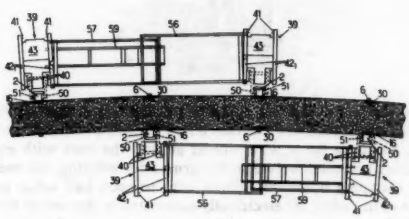
PCT No. PCT/FR83/00222, § 371 Date Jul. 6, 1984, § 102(e) Date Jul. 6, 1984, PCT Pub. No. WO84/01977, PCT Pub. Date May 24, 1984

PCT Filed Nov. 9, 1983, Ser. No. 631,556

Claims priority, application France, Sep. 11, 1982, 82 18725

Int. Cl.³ E04G *11/22, 11/28*

U.S. Cl. 249—20 **21 Claims**



1. Self elevating form work installation with variable geometry for making concrete surfaces or walls, particularly very high concrete walls, these walls being formed by successive lifts or constant height over the whole length of the work until the desired height is obtained, this installation comprising essentially means for temporarily fixing working platforms on an underlying part of the wall which has already been cast and hardened, means for shuttering the next lift over said under lying part, and elevating means adapted to produce self elevation of the whole of the platforms, which installation is characterized in that said fixing means comprise series (2) of main uprights extending substantially in vertical planes, these series being evenly spaced apart along the length of the wall, said main uprights ($2_1 \ldots 2_4$) serving essentially, on the one hand, as elements for maintaining the shuttering forms in position and, on the other hand, as means for guiding and securing self elevating mobile brackets supporting said platforms and transfer means having pivot means on one side and elevation adjustment means on an opposite side of at least one of said uprights.

4,540,151

DEVICE FOR MANUFACTURING MULTIPLE NEEDLE RECORDING ELECTRODE

Martin Pointner, Kirchseon, and Rüdiger Sommer, Raisdorf, both of Fed. Rep. of Germany, assignors to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,380

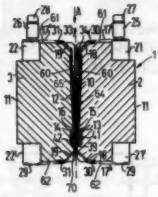
Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217290

Int. Cl.³ B29C *27/30*

U.S. Cl. 249—93 **10 Claims**

1. A device for forming an electrode comb having two rows of needle-shaped recording electrodes with each row connected to a separate circuit board, said circuit boards and rows being encapsulated in a molded body of resin having a rib with a recording edge along one edge of the body with the two rows of electrodes extending to the outer surface of the record-

ing edge with the electrodes of one row being offset from the electrodes of the other row by an amount equal to one-half of the spacing between the electrodes of each row, said device comprising a mold being composed of two symmetrically constructed halves with a rectangular cross-section, each half having a first face with a flat planar surface, a second face opposite the first face having a first recess for receiving a circuit board and a second recess separated from the first recess by a support surface, third and fourth faces extending between the first and second faces, each of said third and fourth faces having a recess adjacent the first face, the third face having means for clamping a wire to a surface thereof; means for holding the two halves with said first surfaces engaging each other to form a parting plane with the second



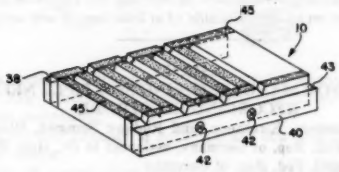
faces being faced in an opposite direction to form a winding core, which receives a circuit board in each of the first recesses, and then has a wire wound around the core with equal spacing and pitch between the turns, after winding, the means for clamping holds the wound wire to each half while each turn of the wires are electrically connected to the circuit board and then severed adjacent the parting plane; and said mold including means for holding the two halves together with the, second faces adjacent each other to form a first mold cavity out of the first recesses and a second mold cavity from the second recesses with the two rows of wires extending therethrough and offset from each other so that after injecting a resin in said cavities, the second cavity forms the rib with the two rows of electrodes adjacent a body containing the circuit boards.

4,540,152

MULTIPLE PART MOLD INSERT

John G. Michalovic, Tonawanda, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Aug. 2, 1984, Ser. No. 636,889
Int. Cl.³ B29C *1/14, 1/06*
U.S. Cl. 249—184 **6 Claims**



6. A mold for forming a serpentine groove in a part molded therein comprising:

a center part having means defining a plurality of generally parallel spaced-apart grooves formed in a planar surface thereof, extending transversely between side edges thereof,

a second part having means defining a plurality of grooves formed therein corresponding in spacing and number to alternate ones of the grooves formed in said center part and positioned at one of the side edges of said center part with its said alternate grooves in alignment with the corresponding grooves in said center part, and

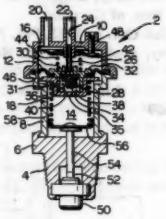
a third part having means defining alternate grooves therein corresponding to the spacing of alternate grooves of said first part, and positioned at the opposite side edge of said center part with its alternate grooves in alignment with grooves intermediate those in alignment with said second part, thereby forming between said grooves a generally serpentine land portion forming the shape of a groove to be formed in a molded part.

4,540,153

TEMPERATURE SENSITIVE NEGATIVE-PRESSURE CONTROL VALVE

Koichi Gomi, Toyota, and Shigeru Nishio, Kariya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of, Japan

Filed Feb. 1, 1982, Ser. No. 344,724
Claims priority, application Japan, Feb. 6, 1981, 56-17271
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—11 **4 Claims**



1. A temperature sensitive negative-pressure control valve comprising:

a valve chamber communicating with an input port, an output port and an atmosphere port;

pressure adjusting means disposed in said valve chamber for regulating a negative pressure which is output through said output port, said presure adjusting means including

a diaphragm dividing said valve chamber into an output chamber communicating with said output port, and an atmosphere chamber communicating with said atmosphere port, said diaphragm being movable by a pressure difference between said output and atmosphere chambers,

a communication passage for providing communication between said output and atmosphere chambers,

a stationary valve seat defining an opening communicating with said input port,

a movable valve seat defining one open end of said communication passage,

a valve member movable with said diaphragm to open said one open end of the communication passage when said diaphragm is moved toward said output chamber, and to open said opening of the stationary valve seat for communicating said input port and said output chamber when said diaphragm is moved toward said atmosphere chamber, so that said valve member is placed in an equilibrium state in which the valve member is seated on both of said stationary and movable valve seats,

a pipe communicating at one end thereof with said input port and protruded at the other end in said output chamber, said stationary valve seat being formed by an end surface of said pipe at said other end thereof,

a pressure plate fixedly disposed in said diaphragm so as to be movable with the diaphragm relative to said stationary valve seat, said pressure plate having said communication passage and said movable valve seat, said other end of the pipe being locating in said communication passage, and

a first spring biasing said pressure plate toward said atmosphere chamber,

said valve member being biased toward said pressure plate so as to be normally seated on said movable valve seat, said valve being seated on said stationary valve seat when the valve is moved with the pressure plate toward said output chamber, whereby said movable valve seat is separated from said valve member when said pressure plate is further moved toward said output chamber;

an adjusting spring for imparting a biasing force to said diaphragm in one of opposite directions toward and away from said atmosphere chamber, said pressure difference between the output and atmosphere chamers in said equilibrium state being determined by said biasing force, whereby the negative pressure to be supplied from said output chamber is determined by said biasing force, regardless of a variation in the negative pressure applied to said input port; and

temperature sensitive means for detecting a temperature, said temperature sensitive means having an output piece movable to vary said biasing force of the adjusting spring imparted to said diaphragm, in response to a variation in the detected temperature, whereby the negative pressure to be output from said output chamber through said output port is continuously varied according to said variation in the detected temperature.

4,540,154

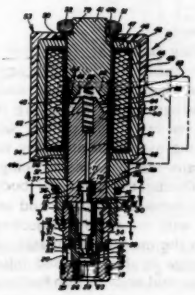
SOLENOID VALVE

Abel E. Kolchinsky, Glenview, and Shaukat Kazi, Chicago, both of Ill., assignors to Imperial Clevite Inc., Glenview, Ill.

Continuation of Ser. No. 392,382, Jun. 28, 1982, abandoned. This application Dec. 11, 1984, Ser. No. 680,419

Int. Cl.³ F16K *31/02*

U.S. Cl. 251—129.15 **8 Claims**



1. In a fluid flow control valve having a valve body and a movable valve member, solenoid structure for selectively positioning the valve member comprising:

an annular coil;

a tubular, rigid, one-piece frame having a sidewall and substantially planar parallel inner and outer end walls defining a coil space, the coil being centered therebetween to extend axially parallel to the sidewall;

a guide tube coaxially within said coil and having a portion spaced radially of and confronting said outer end wall;

a magnetic plunger slidable axially within said guide tube and being connected to said valve;

an adapter removably secured to the valve body and having an axially inwardly projecting annular boss abutting the frame outer end wall;

an annular washer abutting the frame inner end wall and having an annular axially inturned, radially inner flange;

a nut;

threaded plug means secured to the inner end of said guide tube and having an axially inner end projecting through said washer and defining an externally threaded connecting portion, said nut being threaded to said connecting portion to bear forcibly against an inner distal end of said flange and urge said washer axially outwardly against said inner end of the frame, and thereby urge said outer end of the frame axially outwardly against said adapter boss to lock the structure in coaxially assembled relationship; and

an outer housing encapsulating the frame and retaining said washer in association with said frame inner end wall.

4,540,155

FLUID CONTROL VALVES

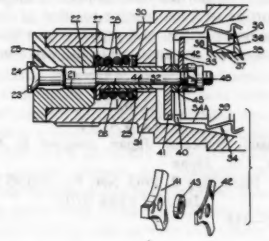
Hugh W. Redston, Alperton, and James C. Potter, London, both of England, assignors to Lucas Industries, public limited company, Birmingham, England

Filed Feb. 8, 1984, Ser. No. 578,128

Claims priority, application United Kingdom, Feb. 26, 1983, 8305408

Int. Cl.³ F16K *31/02*

U.S. Cl. 251—129.20 **5 Claims**



1. An electromagnetically operable fluid control valve comprising a valve body, a valve member movable in a bore in the valve body between open and closed positions, a stem extending from the valve member, a collar mounted about said stem, a coiled compression spring mounted about said stem, one end of the coiled compression spring engaging said collar to urge the valve member to an open position as determined by the abutment of said collar with the valve body, a rigid plate secured to said stem and a plate-like resilient member secured to said stem in spaced relation to said rigid plate and on the side thereof remote from the valve member, a hollow axially movable armature having an inwardly directed flange which is located between said rigid plate and said resilient member, a stator structure within said armature, and electrical windings carried by said stator structure, said armature having a travel greater than that of the valve member, whereby when said windings are energised the force exerted on the armature will be transmitted to said valve stem through said resilient member to cause movement of the valve member to the closed position, said resilient member deflecting when the valve member is in the closed position to allow continued movement of the armature to a limit position.

4,540,156

FLUID FLOW CONTROL VALVE

David E. Cross, Whitburn, England, assignor to Bard Limited, Sunderland, England

Filed Oct. 25, 1983, Ser. No. 545,362

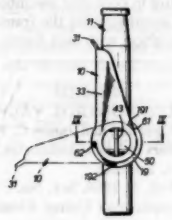
Claims priority, application United Kingdom, Nov. 9, 1982, 8231971

Int. Cl.³ F16K *5/00*

U.S. Cl. 251—309 **10 Claims**

1. A two part valve comprising a valve body and a manually operable, unitary valve member including an insert portion and an integral retaining portion, said insert portion rotatable in the valve body between open and closed positions in which such flow is controlled, said insert portion being housed in a

through aperture of the valve body, a leading end of the insert portion being insertable into said aperture from one end thereof and retainable in an operational and sealing disposition therewithin by said retaining means wherein the retaining means comprises a bridging portion on which said manual



operation is performed, and extending integrally between the insert portion and the retaining portion externally of the valve body, the retaining portion interconnecting the leading end of the insert portion to resist relative rotation of the leading end and the retaining portion, and preventing withdrawal of the insert portion out of the aperture in the valve body.

4,540,157

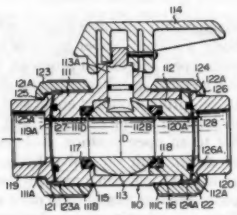
BALL VALVE

Isao Kawanami, Nobeoka, Japan, assignor to Asahi Yukizai Kogyo Co., Ltd., Japan

Filed May 2, 1983, Ser. No. 490,957

Int. Cl.³ F16K *5/06*

U.S. Cl. 251—315 **2 Claims**



1. A ball valve comprising:

a valve housing having a flow passage therethrough;

a spherical ball mounted in said valve housing for movement between an open position and a closed position;

tubular caps having connected means for receiving ends of pipelines and abutting against outer end walls of said valve housing, said tubular caps provided with externally extended annular flanges; and

cap nuts provided with internally extended annular flanges cooperating with said externally extended annular flanges of the tubular caps and internal threads cooperating with said external threads of the valve housing;

said internal threads of the cap nuts being threaded onto the external threads of the valve housing so to firmly connect the valve housing and the tubular caps;

said valve housing including:

a tubular valve body terminating at one end with a cylindrical through hole and at the other end with a larger cylindrical through hole;

a tubular union adhered inside said larger cylindrical hole of the valve body and having a cylindrical through hole;

a valve chamber formed between the valve body and the union, said valve chamber rotatably receiving said ball having a cylindrical through hole;

on the opposite surfaces of the valve body and the union facing the ball annular grooves of rectangular cross-sections are formed, within said annular grooves there being fitted an annular seating ring made of polytetrafluoroethylene backed by an annular resilient ring made of elastic rubber so as to urge said seating ring into tight contact with said ball;

outer end walls of the valve housing being formed substantially in the shape of convex spherical surfaces having radii centered on the axis of said flow passage, and inner end walls of the tubular caps cooperating with the outer end walls of the valve housing being formed complementary to the convex spherical surfaces of said outer end walls; and

inner end walls of the flanges of the cap nuts being formed substantially in the shape of concave spherical surfaces substantially concentric of said outer end walls of the valve housing, and outer end walls of the flanges of the tubular caps being formed complementary to the concave spherical surfaces of said inner end walls.

4,540,158

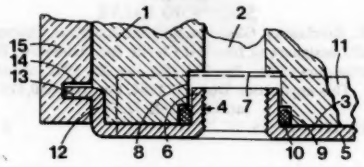
PNEUMATIC VALVE

Hans-Ulrich Jungen, Chancy, Switzerland, assignor to Honeywell Lucifer SA, Geneva, Switzerland

Filed May 30, 1984, Ser. No. 615,408

Int. Cl.³ F16K *51/00*

U.S. Cl. 251—367 **5 Claims**



1. A valve comprising

a body means having an internal fluid duct opening onto a face of said body means via an orifice and

a metal plate means contacting said face, said plate having a tapped fluid passage socket projecting from said plate means and aligned with said orifice, said plate means including fastening means for attaching said plate means to said body means, said plate means being provided with at least one stiffening rib with said body means being arranged to accommodate said rib and said plate means being provided with outwardly projecting lugs substantially parallel to the main plane of said plate means and designed to engage in slots recessed into said fastening means attached to said body or into bodies of other valves attached to the sides of said body means on which said plate means is mounted.

4,540,159

HYDROPNEUMATIC CABLE TENSIONER

Larry B. Jordan, Houston, Tex., assignor to Retsco, Inc., Houston, Tex.

Filed Jul. 22, 1983, Ser. No. 516,102

Int. Cl.³ B25B *25/00*; B66D *1/50*

U.S. Cl. 254—228 **8 Claims**

1. A hydropneumatic cable tensioner comprising:

a base;

a cylinder mounted on said base;

a first enclosure means for enclosing one end of said cylinder;

a first cable sheave mounted to said first enclosure means;

a piston bore chamber within said cylinder;

a piston reciprocable in said piston bore chamber comprising a conical frustum shaped support bushing fitted onto a reduced diameter piston mounting section and butted up to a shoulder on said piston rod; a piston seal bushing

fitted over said reduced diameter piston moving section abutting said support bushing and covering a plurality of grooves on said reduced diameter piston mounting section of said piston rod; and securing means mounted in another of said grooves on said reduced diameter piston mounting section for retaining a piston sealing means onto an axial lip of said seal bushing and for retaining said seal bushing against said support bushing;

a piston rod connected to said piston comprising a reduced diameter piston mounting section thereby forming a shoulder on said piston rod; and a plurality of circumferential grooves defined by said reduced diameter piston mounting section;

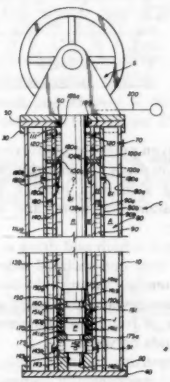
a second enclosure means for enclosing the other end of said cylinder said second enclosure means adapted to permit said piston rod to extend therethrough;

a second cable sheave mounted on the opposite end of said piston rod from where said piston is attached;

a low pressure subchamber within said piston bore chamber;

a high pressure oil chamber surrounding said piston bore chamber, said high pressure oil chamber ported to permit flow between said piston bore chamber and said high pressure oil chamber;

an accumulator chamber within a cylinder surrounding said high pressure oil chamber said accumulator chamber ported to permit flow between said high pressure oil chamber and said accumulator chamber;



piston sealing means for preventing oil from the high pressure oil chamber from entering said low pressure subchamber comprising a plurality of packing rings mounted on said lip of said seal bushing;

restriction means secured within said low pressure subchamber for controlling fluid flow within said piston bore thereby limiting piston velocity in the event of a sudden loss of cable tension and for guiding said piston rod in its reciprocal movements comprising an annular ring fitted within said low pressure subchamber having an inner face positioned around said piston rod; a small gap defined as the space between said annular ring and said piston rod whereupon movement of said piston, fluid flow is restricted within said low pressure subchamber resulting in regulation of piston velocity;

containment means within said piston bore for containing an initial charge of gas, and oil displaced through said restriction means; and

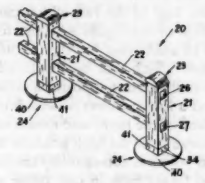
means for introducing regulated compressed gas to said accumulator chamber to pressurize said accumulator chamber wherein oil in said high pressure oil chamber is also pressurized thereby urging said piston to move outwardly which in turn urges said piston rod connected thereto to move outwardly through said second enclosure means thereby tensioning the cable.

4,540,160

RAIL FENCE

James K. Zanavich, Lake Shore Dr., and Alfred M. Smith, 487 Whittemore Rd., both of Middlebury, Conn.

Filed Mar. 28, 1984, Ser. No. 594,387
Int. Cl.³ E04H 17/14
U.S. Cl. 256—19 **9 Claims**



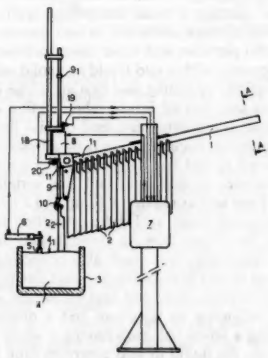
1. A fence structure comprising: a post means having an elongate configuration with an interior space extending substantially along the length of said post means, said post means having at least one rail mounting alcove formed within a side wall portion of said post means, said post means having a threaded bottom mounting end portion, said post means being formed of a plastic material to have a predetermined rigidity and tactility and tensile strength, said post means having a predetermined exterior surface characteristic; a post mounting spike comprising a downwardly projecting spike means, an intermediate disc and a upwardly projecting member having means with internal threads for matingly receiving the threaded bottom mounting end portion of said post means, said post mounting spike being formed of a plastic material to have a predetermined rigidity and tactility and tensile strength; A rail means having an elongate configuration with an interior space extending substantially along the length of said rail means, said rail means having a mounting end member at each end thereof each configured for being receivably mounted within a respective rail mounting alcove, said rail means being formed of a plastic material to have a predetermined rigidity and tactility and tensile strength, said rail means having a moulded-in exterior surface characteristic.

4,540,161

INSTALLATION FOR THE FUSION OF METAL INGOTS

Guy Lefebvre, Bourron-Marlotte, France, assignor to Dynamold International, Melun, France

Filed Apr. 9, 1984, Ser. No. 598,005
Int. Cl.³ F27B 9/38
U.S. Cl. 266—95 **8 Claims**



1. In an installation for the fusion of metal ingots including

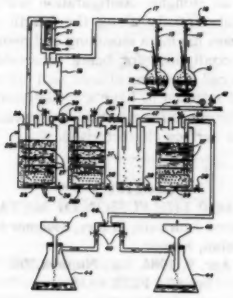
an electric furnace, a float which detects variations of the level of the bath of molten metal in the furnace, and a mechanism, activated by the float, for controlling the progressive lowering of a metal ingot into the bath, wherein the installation includes a rail on which can be suspended several metal ingots one behind the other, said rail being inclined towards the surface of the bath so that its lower end is above the surface of the bath and so that the ingots slide along the rail under their own weight towards said lower end, a means of retention for the ingots at the lower end of the rail which can deliver, when it is activated, the first of the ingots adjacent to the lower end of the rail, a means of anchoring for the ingots delivered by the means of retention which can be displaced between a high position where it is situated in a position adjacent to the lower end of the rail and a low position in which it is situated above and near the surface of the bath, said means of anchoring being commanded to move from its high position to its low position by the mechanism which is activated by the float, said means of retention has two finger bars in one piece with a supporting axle which is capable of movement perpendicular to the rail, said finger bars being parallel to their supporting axle and being displaced in relation to each other along a longitudinal direction in relation to the rail, the free ends of said finger bars facing each other.

4,540,162

GAS-SCRUBBING AND METAL-REFINING PROCESS AND SYSTEM

Armand Gozlan, 6600 Kildare Rd., Apt. 1903, Côte Saint-Luc, Canada (H4W 2V4)

Filed Feb. 24, 1983, Ser. No. 469,155
Int. Cl.³ B01D *50/00*
U.S. Cl. 266—146 **4 Claims**



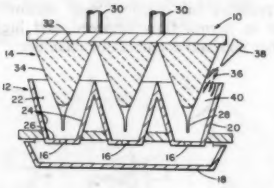
1. In a metal-refining system, the combination comprising: a container for reacting a metal compound with an acid in a liquid and solid mixture contained in said container with production of solid particles and toxic vapor products, a first air intake tube opening within said liquid and solid mixture and an exhaust line serially including said first air intake tube and said container with said first air intake tube defining the upstream end of said line, the downstream end of said line being connected to a source of vacuum, a gas flow-adjustable second air intake connected to said line adjacent said downstream end to adjust the vacuum in said line, said line serially including, downstream from said container, a sump and a heat exchanger disposed above said sump, said sump collecting solid particles entrained by the vapors flowing through said line from said container to said sump, said sump also collecting liquid condensate formed in said heat exchanger, said line further serially including downstream from said heat exchanger a vapor purifying means including an upstream and a downstream tank each containing a liquid and each having a vapor outlet at the top of the tank, the liquid in said upstream tank being water, the liquid in said downstream tank being a water solution of a substance selected from the group consisting of caustic soda and slaked lime, a casing in each tank immersed in said liquid, the casing in said upstream tank having a vapor inlet serially communicating through said line with the downstream end of said heat exchanger, the casing in said downstream tank having a vapor inlet connected to the vapor outlet of said upstream tank, each casing having a wall formed with a plurality of tiny gas outlet apertures for producing gas bubbles rising in said liquid, each casing enclosing entrance tubes, each having an outlet end fixed to the inside of said wall and communicating with one of said gas outlet apertures, each entrance tube having an inlet end opening within said casing, whereby any solid particles in said casing reaching said inlet end of said tube will fall back towards the bottom of said casing, thereby preventing clogging of said gas outlet apertures.

4,540,163

PRESS FOR RECOVERING METAL FROM DROSS

Jan H. L. van Linden, Allison Park, Pa., and James S. Whitehead, Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 29, 1984, Ser. No. 676,439
Int. Cl.³ B01D *35/18*
U.S. Cl. 266—201 **12 Claims**



1. A power driven press for recovering free aluminum metal from hot aluminum dross which forms on the surface of molten aluminum during aluminum melting operations, said dross containing free aluminum metal and a solids network, said press comprising:

(a) a receptacle into which said dross is charged, said receptacle having at least one inclined sidewall and at least one passageway extending through the bottom of the receptacle, said bottom passageway being sized and configured to permit the passage of free liquid aluminum but inhibit the passage of said solids network;

(b) means for supporting the receptacle;

(c) ram means for mechanically compacting the dross by applying a compressive force on the dross and against the inclined sidewall such that a substantial portion of the free aluminum separates from the dross and passes through the bottom passageway, said ram means having a ramming surface facing the inclined sidewall surface of the receptacle, said ramming surface being inclined at an angle slightly less than that of the sidewall surface such that the facing surfaces cooperate during dross compaction to inhibit upward displacement of dross and direct movement of the free aluminum in the dross downwardly towards the bottom passageway, thereby enhancing removal of the free aluminum from the dross;

(d) power source attached to the ram for reciprocally driving the ram into and out of the receptacle; and

(e) means for collecting the free aluminum metal which passes through the bottom passageway.

4,540,164

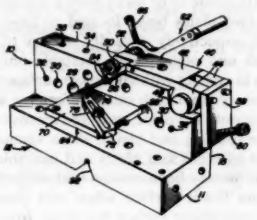
WORKPIECE HOLDER

Edwin J. Shade, Jr., Lyons Station, Pa. 19536

Filed May 17, 1983, Ser. No. 495,081
Int. Cl.³ B25B *1/00*
U.S. Cl. 269—88 **10 Claims**

1. A workpiece holder comprising a plate formed with a

depression in one edge theeof for receiving an elongate workpiece in a manner providing rotation of the workpiece about its longitudinal axis, and hold-down means for the workpiece including a lever provided with a roller means, means for pivotally mounting the lever on the plate with the roller means engaging the workpiece, and an adjustment screw for connection between the lever and the plate to provide pivotal move-



ment of the lever for tightening the roller means against the workpiece, wherein the lever has a first arm provided with said roller means and a second arm angled with respect to the first arm, the means for pivotally mounting the lever being situated at a corner of the plate so that the second arm of the lever extends along another edge of the plate adjacent said one edge, and the adjustment screw being operable between the second arm of the lever and said another edge of the plate.

4,540,165

OPERATING TABLE

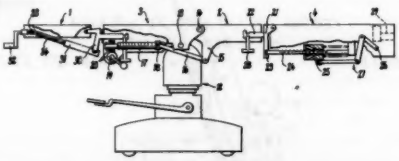
John F. Green, Burwood, and Richard A. Morris, Elsternwick, both of Australia, assignors to Denyers Pty. Ltd., Victoria, Australia

Filed Aug. 3, 1982, Ser. No. 404,707

Claims priority, application Australia, Aug. 4, 1981, PF0049

Int. Cl.³ A61G *13/00*

U.S. Cl. 269—325 **19 Claims**



13. An operating table having first and second ends including a support structure,

an elongate table top mounted on said support structure and having a longitudinal axis,

said table top being composed of a first transferable section, an upper torso section, a lower torso section and a second transferable section, each of said sections having two opposite end edges extending transverse to said longitudinal axis, the sections being arranged adjacent to each other along said longitudinal axis in edge to edge relationship,

the adjacent end edges of each two adjacent sections extending transverse of said longitudinal axis of said table top and each said section being movable relative to its adjacent section about an axis also extending transverse to said longitudinal axis,

said first transferable section being normally located at said first end of said table,

first releasable connecting means connecting said first transferable section to said upper torso section,

said second transferable section being normally located at said second end of said table top and having an inner end and an outer end,

a second releasable connecting means for connecting the inner end of said second transferable section to said lower torso section,

further connecting means at the outer end of said second transferable section whereby said first transferable section in a modified configuration of the operating table can be selectively releasably mounted to the outer end of said second transferable section, said second transferable section being positionable at said first end of said table,

said lower torso section comprising two generally parallel side frame members having inner and outer ends and defining an open space between them for passage of radiation, the inner ends of the parallel side frame members of the lower torso section being pivotally mounted to the upper torso section, the outer ends of the side frame members of the lower torso section being connected by a radiolucent cross-piece arranged to provide a degree of torsional stability to the lower torso section and enabling the entire length of the lower torso section between the parallel side frame members thereof to be made radiolucent, said radiolucent cross-piece being in the general form of a slat having opposed broad surfaces which are generally vertical when the table top is generally horizontal, and

drive means for effecting pivotal movement of the lower torso section relative to the upper torso section, the drive means being arranged to provide a positive drive to both sides of the lower torso section so that the table top has sufficient torsional stability in its said modified configuration.

4,540,166

AUTOMATIC FEEDER

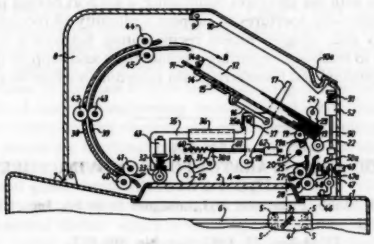
Hans A. Massengeil, Munich, Fed. Rep. of Germany; Robert Overmeer, Mortsel, Belgium; Joachim Pietruska, Fürstenfeldbruck, Fed. Rep. of Germany, and Jean J. Caufriez, Brussels, Belgium, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 24, 1983, Ser. No. 497,733

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220235

Int. Cl.³ B65H *1/06, 9/06, 31/20*

U.S. Cl. 271—3.1 **12 Claims**



1. An automatic feeder for feeding originals in a photographic copying machine of the type in which an original is transported across a transparent exposure plate for projecting in an exposure station of the copying machine, comprising supporting means for receiving a stack of originals lying in said stack in a predetermined orientation in which lower sides of the originals face said supporting means, means for transporting an original being processed from said stack towards said exposure plate and from said exposure plate back to said stack and operative for returning the original to said stack in said predetermined orientation, said exposure plate having a front end and a rear end as viewed in the direction of transportation of the original; a number of non-driven tappet rollers positioned against said exposure plate at the front end thereof for receiving a front edge of the original when the latter is positioned on said exposure plate; displaceable stop means on said supporting means for adjusting said supporting means to differing lengths of originals being processed; first adjustment means

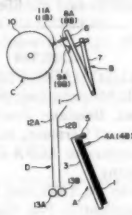
for displacing said stop means and adjusting the latter on said supporting means; second adjustment means connected to said tappet rollers for adjusting the latter relative to said exposure plate in said direction of transportation, said first adjustment means being operatively connected to said second adjustment means so that the adjustment of said stop means to a predetermined format length of the originals by said first adjustment means causes a corresponding adjustment of said tappet rollers by said second adjustment means, said tappet rollers being biased by springs, said first adjustment means including a first slide connected to said stop means and said second adjustment means including a second slide connected to said tappet rollers, the feeder further including an adjustment lever operatively connected to said first slide and said second slide.

4,540,167

APPARATUS FOR MOUNTING A RECORDING MEDIUM

Kaoru Tamura, and Kiichiro Sakamoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 7, 1982, Ser. No. 447,554
Claims priority, application Japan, Dec. 21, 1981, 56-207711
Int. Cl.³ B65H *5/08*
U.S. Cl. 271—11 **9 Claims**



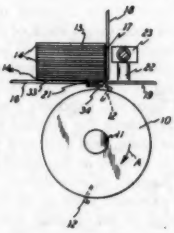
1. Apparatus for mounting a recording medium having positioning apertures on a mount having positioning pins engageable with the apertures comprising; a support having pins engageable with apertures to support a plurality of recording mediums and, transfer means reciprocating between a first position to remove a recording medium from said support to a second position and transferring said recording medium to said mount.

4,540,168

METHOD AND APPARATUS FOR REMOVING SHEETS FROM A STACK

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Jun. 22, 1983, Ser. No. 506,525
Int. Cl.³ B65H *3/08*
U.S. Cl. 271—101 **6 Claims**



1. Apparatus for singly removing sheets from the bottom of a stack of sheets having a front side and two corners at the limits of said front side and wherein the sheets are in a horizontal orientation and the sheet on the bottom has a lower surface and two corners, comprising two spaced-apart flat plates rotatably mounted to be adjacent said stack of sheets and being rotatable in opposite directions in simultaneous contact with said lower surface for upwardly supporting said stack of sheets and for forming said lower surface into a smooth flat plane and to subsequently rotate to be away from a portion of said lower surface, said two plates being located to have their rotation axes disposed respectively inwardly relative to said two corners and with said plates being rotatable only toward said corners when in contact with said lower surface for urging said two corners away from each other in forming said lower surface into the smooth flat plane, powered means connected with said plates for rotating said plates, and a vacuum pick-up device mounted adjacent said plates and movable upwardly to said plane and thereby be in contact with and operable on said portion of said lower surface when said plates are still in contact with said lower surface but away from said portion, and thereafter moving said plates away from said lower surface for removing said bottom sheet from said stack of sheets by said vacuum pick-up device.

4,540,169

CASSETTE SHEET FEED APPARATUS

Leo Levinson, Berkeley, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1983, Ser. No. 538,594
Int. Cl.³ B65H *1/22*
U.S. Cl. 271—127 **11 Claims**

1. Sheet feed apparatus for feeding sheets from a stack to a utilization device having internal support members and sheet removing means, wherein the stack of sheets is contained within a receptacle movable in a first direction into and out of said utilization device and movable in a second direction toward and away from said sheet removing means, the improvement being characterized by including

slider means on opposite side walls of said receptacle,

guide means on said support members, for receiving said slider means and for controlling the direction of movement of said receptacle, and

reciprocable cam means supported by said guide means, said cam means having a cam surface for simultaneously urging said slider means in said first and second directions, whereby as said slider means moves within said guide means said cam means initially urges said slider means out of said utilization device in said first direction and subsequently urges said slider means in said second direction to lock said receptacle in place within said utilization device

and to move said receptacle so that said sheet removing means is in driving contact with the sheets in said stack.

4,540,170

PAPER FEED CONTROL DEVICE

Shunichi Masuda, Tokyo; Katsushi Furuichi, and Naomi Takahata, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 369,755, Apr. 19, 1982, abandoned. This application Sep. 18, 1984, Ser. No. 651,659
Claims priority, application Japan, Apr. 27, 1981, 56-64936
Int. Cl.³ B65H *7/02*
U.S. Cl. 271—259 **9 Claims**

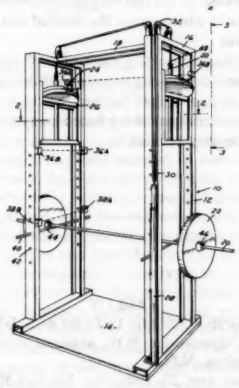
1. A feed control apparatus comprising:
conveying means for conveying a sheet to a predetermined position;
detecting means for sensing a trailing edge of the sheet conveyed by said conveying means;
control means for controlling said conveying means in accordance with a trailing edge sensing output signal from said detecting means; and
compensating means for compensating a pseudo-trailing edge detection signal from said detecting means such that when said detecting means produces said pseudo-trailing edge detection signal before the sheet passes through said detecting means, said pseudo-trailing edge detection signal is inhibited from being supplied to said control means.

4,540,171

VARIABLE RESISTANCE EXERCISE APPARATUS

Charles G. Clark, Apt. 614, 6621 Yale, Westland, Mich. 48185, and Jack D. Clark, 3650 Hi-Dale Dr., Lake Orion, Mich. 48035

Filed Jun. 16, 1982, Ser. No. 389,023
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—118 **12 Claims**



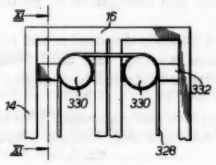
1. An apparatus for physical exercise where a user conducts a repetitive cyclic movement while subjected to a load which is reduced in magnitude during parts of each cycle wherein the muscles of the user go through a lengthening and shortening, said apparatus comprising:
(a) a frame;
(b) a coupling means which cooperates with the frame for coupling the user to the apparatus;
(c) a loading means which cooperates with the coupling means to exert a force on the user during the exercise which constitutes a lengthening of the muscles;
(d) an unloading means which cooperates with the frame and the loading means to reduce the force exerted on the user during a portion of the exercise which constitutes a shortening of the muscles; and
(e) means for sensing the position of the coupling means to signal the unloading means to remove a portion of the load during a portion of the exercise cycle when the muscles are being shortened and to signal the loading means to reapply a portion of the load during a portion of the exercise cycle when the muscles are being lengthened.

4,540,172

FRICTION TYPE EXERCISING DEVICE

Harold R. Evans, Jersey, Channel Islands, assignor to Tekron Licensing B.V., De Leersum, Netherlands

Continuation of Ser. No. 861,415, Dec. 16, 1977, abandoned. This application Feb. 2, 1981, Ser. No. 230,514
Claims priority, application United Kingdom, Dec. 18, 1976, 52985/76
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—133 **8 Claims**

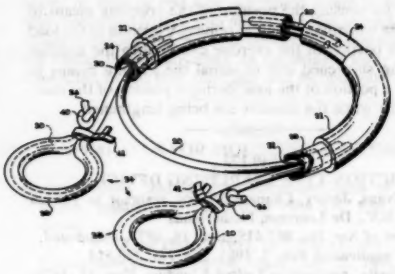


1. Exercising equipment comprising a pair of guide tracks, each said track having a pair of spaced parallel slideways, means for supporting the guide tracks in an inclined manner with one end higher than the other, a pair of foot-supporting members carried one on each of said tracks, each said foot-supporting member having a pair of slide portions supported on said slideways and a foot support portion between said slide portions, an elongate flexible tension-bearing element engaging each of said foot-supporting members, and guide means for said tension bearing element, said guide means including means for producing frictional resistance to movement of said foot-supporting members, said guide means comprising first and second guide members which are angularly fixed relative to said tracks near said one end and each having at least a partially cylindrical surface which is fixed against rotation relative to said tracks and said tension-bearing element, wherein said tension bearing element extends upwards along the track system from one foot-supporting member in a direction generally parallel to the direction of movement of the said one foot-supporting member to said first guide member, transversely of said tracks to said second guide member, and downwards along the track system to the other foot-supporting member in a direction generally parallel to the direction of movement of the said other foot-supporting member to provide reciprocating movement of said foot-supporting members, wherein said tension bearing element extends around said surfaces to be in frictional contact therewith, wherein tension in said tension bearing element produced by weight on said foot-supporting members causes said element to bear against said surfaces, and wherein the flexible tension bearing element is forced to slide frictionally around said surfaces when the foot-supporting members move along said track system such that energy is frictionally dissipated in said guide members and tension bearing element during exercise.

4,540,173
BODY ATTACHED ELASTIC TYPE EXERCISING DEVICE

David E. Hopkins, Jr., 1045 Catalina Dr. #12 P.O. Box 2312, Livermore, Calif. 94550

Filed Dec. 12, 1983, Ser. No. 560,372
Int. Cl.[3] A63B 21/02
U.S. Cl. 272—139 8 Claims

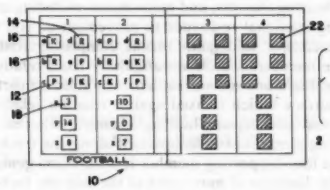


1. A portable body attached exercising apparatus comprising:
an elongated hollow cylindrical housing having two opposing open ends and configured to partially encircle the user's body;
an overlap cord partially disposed in and extending through said cylindrical housing, said cord being formed of an elastic material and adapted to engaging a person's midsection; and
said cord having two ends extending from and each said end of said cord having a loop forming a handgrip.

4,540,174
GAME OF CHANCE PARTICULARLY ADAPTED FOR PLAY IN CONJUNCTION WITH A TEAM SPORT CONTEST

C. Wallace Coppock, 620 E. Washington St., Petaluma, Calif. 94952

Filed Apr. 16, 1984, Ser. No. 601,011
Int. Cl.[3] A63F 9/00
U.S. Cl. 273—138 R 12 Claims

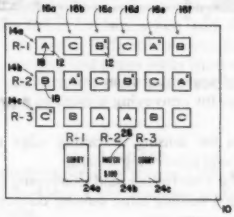


1. A game of chance to be played in conjunction with a team sport contest being broadcast and designed to attract and hold one's attention to said contest and to intermittent commercials broadcast throughout, said game comprising:
a plurality of game cards marked with at least one row of spaces for each period of said contest;
a plurality of symbols, each representing a scoring feature that might occur during said contest;
each of said cards being individually marked with one of said symbols placed at random in each of said spaces; and
broadcast signal means transmitted during a commercial break identifying the particular space in said one row representing the next contest period to match against a corresponding scoring feature characteristic during said next period.

4,540,175
GAME OF CHANCE

C. Wallace Coppock, 620 E. Washington St., Petaluma, Calif. 94952

Filed Aug. 27, 1984, Ser. No. 644,632
Int. Cl.[3] A63F 9/00
U.S. Cl. 273—139 4 Claims



1. A game of chance comprising:
a game card for each player having delineated thereon a plurality of rows of first spaces arranged in columns;
a plurality of symbols, one marked at random in each first space of a column thereof;
a removable mask covering each of said first spaces to render a symbol therein invisible;
one mask in a column thereof being removable by the player in an attempt to uncover that symbol which is called out;
a successful attempt being deemed a match;
a group of further spaces equal in number to the number of said rows of first spaces;
an identification mark adjacent each of said further spaces, each to represent one of said rows;
a success marking in the further space representing that one of said rows in which occur the desired relative number of matches; and
a removable mask covering each of said further spaces to render a success marking therein invisible so that a player may unmask one of said further spaces in an attempt to uncover the success masking based on symbols in said first spaces previously unmasked.

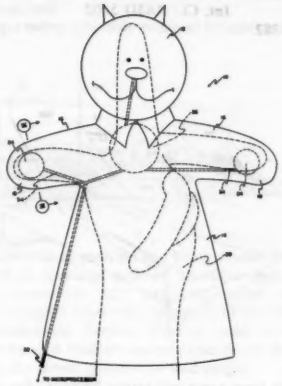
4,540,176
MICROPROCESSOR INTERFACE DEVICE

Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 25, 1983, Ser. No. 526,307
Int. Cl.[3] G06F 3/02; A63H 3/14
U.S. Cl. 273—148 B 11 Claims

1. A user interface device for interfacing with a microprocessor of a video game unit comprising:
(a) a hand puppet adapted to be worn on the user's hand;
(b) input swith means disposed within said puppet developing input signals to the microprocessor, said input switch

means functioning in conjunction with the user's hand within the puppet; and,



(c) first connector means for operably connecting said input switch means to the microprocessor as an input thereto.

4,540,177

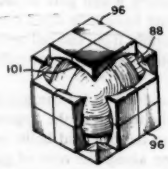
PUZZLE CUBE

Tibor Horvath, 1877 E. 27 St., Brooklyn, N.Y. 11229

Continuation-in-part of Ser. No. 305,479, Sep. 25, 1981, Pat. No. 4,405,131. This application May 24, 1982, Ser. No. 381,183

Int. Cl.³ A63F *9/08*

U.S. Cl. 273—153 S **4 Claims**



1. A puzzle device, comprising eight inner shell members, first support means supporting said inner shell members for relative rotation in first groups about orthogonally related axes, a plurality of outer shell members located outwardly of and exceeding in number that of said inner shell members and second means supporting said outer shell members from said inner shell members for movement with an relative to said inner shell members for rotation in second groups about orthogonally related axes, said first support means comprising an inner core member and a plurality of mutually spaced retainer members connected to and spaced from and surrounding said core member and having inside faces lying in a spherical plane concentric with said core member and a plurality of peripherally spaced slide members underlying said retainer member inside faces and each being movable in a circular path about orthogonally related axes intersecting at the center of said spherical plane, some of said inner shell members being connected to respective ones of said slide members and disposed outwardly of said slide and retainer members, each of said inner shell members having a spherical outer face and three orthogonally related corners provided with 90 degree arcuate recesses, said shell members being relatively movable to bring groups of four of said recesses into registry to delineate six orthoganally related circular apertures, four central of said outer shell members associated with each of said circular apertures and each having a first coupling element projecting therefrom and peripherally slidably engaging the edge delineating the repective aperture, the outer edges of each of said central outer shell members having a depending outer border with an arcuate face spaced from and concentric with said inner shell members outer face to delineate orthogonally related spaced guide paths.

4,540,178

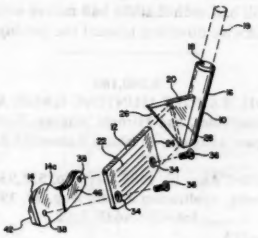
GOLF IRON AND METHOD OF CONSTRUCTION

Louis W. Johnson, and Bruce G. Johnson, both of 2435 Prairie Rd., Eugene, Oreg. 97402

Filed Aug. 30, 1983, Ser. No. 527,826

Int. Cl.³ A63B *53/02*

U.S. Cl. 273—169 **9 Claims**



1. A golf club iron comprising

a head portion,

said head portion including a hosel having means arranged to connect it to a shaft,

said head portion also including a body member formed independently of said hosel,

said body member having top and bottom edges and first and second end edges,

said body member also having a front ball striking face and a rear face,

and weld means engageable between said hosel at said first end edge of said body member securing said body member to said hosel in a desired permanently positioned loft and lie,

said top and bottom edges of said body member and said second end edge thereof comprising perimeter edges of said head portion.

4,540,179

TRAINING METHOD FOR PUTTING GOLF BALLS

Frederick A. Slagle, 7050 Griswold Rd., Madison, Ohio 44057

Filed Oct. 31, 1983, Ser. No. 545,941

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—186 C **4 Claims**

1. A training method for teaching and/or improving the user's skills in putting a golf ball on a putting surface, the steps

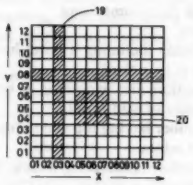
including providing a golf putter having a putter face, placing a golf ball on the putting surface, placing a spinner member having an inclined ramp-like surface on the putting surface, positioning said golf ball in front of said spinner member with said inclined ramp-like surface extending downwardly and rearwardly away from said golf ball, addressing said golf ball by placing said putter face immediately adjacent the rear of said golf ball on the opposite side of said spinner member and taking said putter face in a back-swing by a smooth, low putting stroke away from said golf ball, reversing said putting stroke and moving said putter face downwardly with a low putting stroke so as to move the putter face into contact with said spinner member and up and over said inclined ramp-like surface for striking said golf ball by said putter face with an upwardly moving stroke of said putter face as it approaches and reaches contact with said golf ball so as to impart a topspin to the golf ball such that the ball moves with over-spin in a counterclockwise direction toward the putting hole.

4,540,180

ELECTRONIC TARGET HUNTING GAME APPARATUS

Akitaka Morita, Nara, and Hiroshi Nittaya, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1983, Ser. No. 521,934
Claims priority, application Japan, Aug. 20, 1982, 57-145080
Int. Cl.³ A63F *9/02*
U.S. Cl. 273—313 **7 Claims**



1. An electronic game apparatus comprising:

keyboard means including a plurality of numerical keys and function keys;

game start means for selectively actuating a specific electronic game mode;

game set means responsive to the game start means for setting an X-Y coordinate matrix of a selected size and for positioning at least one target inside the matrix, the position of said target being defined by randomly selected X-Y coordinates;

memory means responsive to the game set means for storing the X-Y coordinate matrix size and the target position;

first search means actuated by said keyboard means for scanning a pair of intersecting lines within said X-Y matrix, defined by selected X and Y coordinates, for the presence of said target;

second search means actuated by said keyboard means for scanning a rectangular block within said X-Y matrix, defined by a selected range of X and Y coordinates, for the presence of said target;

indication means responsive to the first and second search means for indicating whether the target is in said first and second lines or rectangular block;

bombardment means for supplying a signal to a selected coordinate within said first and second lines or rectangular block in an attempt to hit said target with said signal;

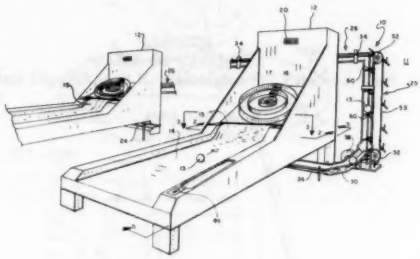
display means for displaying data of the matrix size, the target number, the search region of the first and second search means in the matrix, and for displaying the results of the bombardment.

4,540,181

GAME BALL RETURN BALANCER

Donald A. Nelson, 5755 S. Village Way, Ogden, Utah 84403

Filed Nov. 5, 1984, Ser. No. 668,084
Int. Cl.³ A63D *5/02*
U.S. Cl. 273—352 **5 Claims**



1. A bowling type game ball return balancer for use with a row of at least two game devices using such balls, said ball return device comprising:

an elongate, longitudinally inclined, upwardly opening trough arranged along the row of game devices;

a game ball return board for installation in each game device, each board having a ball drop opening therethrough, said board being positioned so that each ball thrown by a player rolls by gravity thereon to and inclined so that said ball then rolls to drop through the ball drop opening into the trough;

an elongate ball return rail assembly arranged along the row of game devices, and elevated to be everywhere higher than the ball return boards of the game devices in the row, said rail assembly including a ball gate at each game device in the row, said gate having an open position which allows a ball to roll laterally from the rail assembly, and a closed position preventing the ball from rolling laterally from the rail assembly;

ball conveyor means positioned to lift the game balls from the lowermost end of the trough to the uppermost end of the rail assembly and to deposit said balls onto said rail assembly to roll thereon along the row of game devices toward the opposite end thereof;

a ball return chute connecting with the rail assembly at each ball gate to receive the balls from the rail assembly when the gate is in open position, and arranged to direct the balls downwardly onto the ball return board to return to the game device for subsequent use by a player;

means counting the balls entering the ball return chute;

means closing the open gate in response to the counting means when a pre-set number of balls have entered the chute therethrough;

means for resetting the ball counting means when the gate is closed; and

means automatically opening the gate of the game device being used at the beginning of each game.

4,540,182

POWER OPERATED TARGETS FOR SHOOTING RANGES

Tommy G. Clement, 1012 Florence Rd., Savannah, Tenn. 38372

Filed Mar. 23, 1983, Ser. No. 477,869
Int. Cl.³ F41J *7/04*
U.S. Cl. 273—392 **13 Claims**

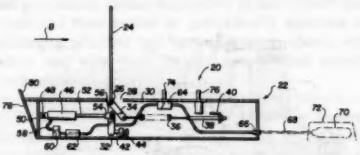
1. A target apparatus for shooting ranges and the like comprising:

a support structure;

a heavy metal target pivotally mounted on said support structure;

resilient means, operative between the support structure and the target, for urging the target towards an upstanding position; and

said target being yieldably retained by said resilient means in



said upstanding position and being caused to start to pivot therefrom towards a down position upon impact of a bullet thereupon, said target thereafter falling to said down position under the influence of its own weight and simultaneously further loading said resilient means, whereby said resilient means experiences maximum loading in the down position of said target.

4,540,183

LINED GASKET OR SEALING INSERT AND METHOD OF MAKING SAME

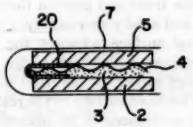
Walter Schneider, Ketsch; Klaus-Peter Ebert, Gaiberg, and Konrad Otto, Schwetzingen, all of Fed. Rep. of Germany, assignors to Kennecott Corporation, Cleveland, Ohio

Filed Oct. 26, 1982, Ser. No. 436,767

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1981, 3142535

Int. Cl.³ F16J *15/12*

U.S. Cl. 277—1 **10 Claims**



1. A method of producing a lined sealing gasket for insertion between a pair of opposing enameled wall surfaces of a metal vessel comprising:

(a) forming an outer shell gasket means

(b) inserting, within said outer shell, a pair of gasket insert ring members

(c) arranging said pair of gasket insert ring members within said outer shell, in a spaced apart relationship to each other, such that a face of each of said gasket insert ring members is opposed to a face of the other of said gasket insert ring members in said pair and the inner surface of said outer shell is in contact with the un-opposed faces of said pair of gasket insert ring members

(d) inserting a band-shaped inner shell means, open only at its outer periphery, between said opposed faces of said pair of gasket insert ring members in such a position that the inner end of said inner shell extends beyond said pair of gasket insert ring members to form a filling ring means while the outer surface portions, of said inner shell means, adjacent to said outer periphery of said inner shell means, are in contact with said opposed faces of said gasket insert ring members.

(e) interposing an un-hardened pasty substance between said opposed faces of said pair of gasket insert ring means and within said inner shell means,

(f) placing the assembly, comprising said outer shell gasket means and said pair of gasket insert ring members and said inner shell means, between opposing wall surfaces to be sealed.

(g) applying a uniform pressure along the sealing surfaces of said assembly to squeeze said pasty substance to form a seal of desired surface dimensions and form; and

(h) hardening said pasty substance.

4,540,184

SAND-FILLED SEALING STRUCTURE BETWEEN AT LEAST ONE TUBE AND A TUBE SUPPORT PLATE

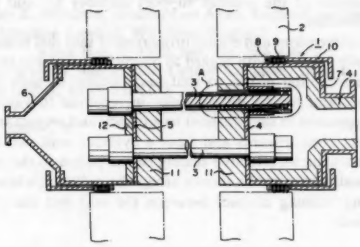
Kunio Takahashi; Noriyuki Oda, both of Chiba; Nobuyuki Kido, Fujisawa, and Keizi Muramatsu, Ichikawa, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,261

Claims priority, application Japan, Jan. 26, 1984, 59-11059; Feb. 16, 1984, 59-26028

Int. Cl.³ F16J *15/14*

U.S. Cl. 277—12 **13 Claims**



1. A sealing structure between at least one tube and a tube support plate having a hole for each tube to extend therethrough, characterized in that a ring member enclosing each tube with a space therefrom is secured to the tube support plate, a sand is filled in the space to form a cylindrical sand layer surrounding the tube, and a means for preventing leakage of the sand is provided at each axial end of the sand layer.

4,540,185

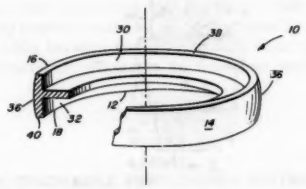
GAS-LUBRICATED SEAL FOR SEALING BETWEEN A PISTON AND A CYLINDER WALL

David P. Hoult, Box 89, Wellesley, Mass. 02181

Filed Jun. 13, 1984, Ser. No. 620,159

Int. Cl.³ F16J *9/00, 15/40, 9/08*

U.S. Cl. 277—174 **5 Claims**



1. A seal for sealing between a piston and a cylinder wall comprising

an annular support member shaped and dimensioned for fitting circumferentially to a piston,

an annular runner affixed to said support member at a transition region situated near the surface of the piston, so as to lie in a clearance space between a piston and a cylinder wall, said runner being free of forces expanding it against said cylinder wall,

said runner having upper and lower wing portions extending

respectively above and below said transition region, said upper wing portion having a back surface exposed when installed to the pressure of gas above the seal, and said lower wing portion having a back surface exposed when installed to the pressure of gas below the seal,

said runner having an outwardly convex contoured surface extending from the distal end of the upper wing to the distal end of the lower wing, said contoured surface, when installed, facing a cylinder wall and defining a channel between a cylinder wall and said seal, the portion of said contour surface approaching most closely to the cylinder wall being a sealing zone, said sealing zone encircling a piston when installed, said contoured surface being exposed to pressure of gas leaking through said channel,

said runner, as seen in cross section, pivoting elastically with respect to said support member around a rotation center in said transition region in response to moments generated by pressure forces on surfaces of said wings, said rotation center being maintained at a invarient distance from the center of the annular support member by said support member,

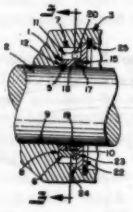
the dimensions and elastic properties of said seal being mutually selected with regard to operating pressures and diameter of the piston so that said runner, as seen in cross section, rotates differentially in response to varying gas pressures in said channel to advance and retract said sealing zone towards and from a cylinder wall and thereby maintain an effective sealing of the piston to the cylinder wall as the piston moves along the cylinder while avoiding rubbing contact between the seal and the cylinder wall.

4,540,186

ANTI-ROTATION DEVICE FOR CONTRACTING ROD RING SEALS

Glenn S. Beidler, Vicksburg, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Jan. 28, 1985, Ser. No. 695,725
Int. Cl.³ F16J *15/26, 15/54*
U.S. Cl. 277—195 **14 Claims**



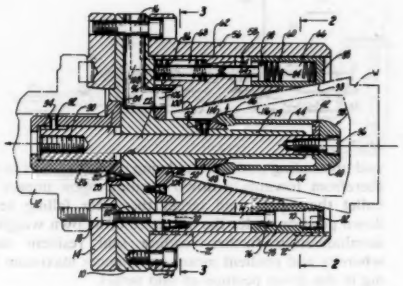
1. In combination, a circumferential ring seal including concentric inner and outer rings each having a joint gap therein, and anti-rotation means for maintaining the respective joint gaps in said rings out of alignment with each other, said anti-rotation means comprising an annular washer adapted to be placed adjacent one side of said seal, said washer having a pair of circumferentially and radially spaced tabs protruding axially from the side of said washer facing said seal, said tabs being adapted to be received in the respective joint gaps in said inner and outer rings.

4,540,187

COLLET CHUCK FOR TAPERED WORKPIECES

Longine V. Morawski, and Lawrence V. Morawski, both of P.O. Box 631, Roseville, Mich. 48066

Filed Jun. 27, 1984, Ser. No. 624,922
Int. Cl.³ B23B *5/22*
U.S. Cl. 279—1 L **8 Claims**



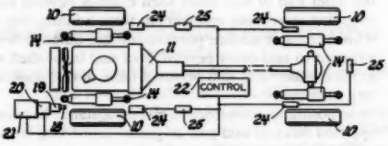
1. A collet chuck for gripping an externally tapered workpiece comprising a body adapted to be mounted concentrically on the front end portion of the spindle of a machine tool, a collet sleeve axially shiftable on said body, said collet sleeve having a plurality of circumferentially spaced, radially resilient fingers thereon, means for shifting the collet axially, a collet expander mounted on the body and cooperating with the collet fingers to grip a workpiece when the collet sleeve is shifted axially in one direction, a front slide and a rear slide mounted on said body for independent axial movement thereon concentric with said collet sleeve, means biasing each slide in axially forward direction, the front slide having an inner peripheral surface adjacent the front end portion thereof which inclines radially inwardly and axially rearwardly, the rear slide having an inner peripheral surface adjacent the rear end portion thereof which inclines radially inwardly and axially rearwardly, said inclined surface of the front slide being of larger diameter than said inclined surface of the rear slide to enable an externally tapered workpiece to be inserted axially into said slides and thereby successively engage said inclined surfaces of the two slides to position the workpiece concentrically on the chuck and a stop mounted on said body in a position to be abutted by the workpiece after the workpiece has been shifted axially rearwardly on the chuck into engagement with said inclined surface of both slides.

4,540,188

AUTOMATIC VEHICLE LEVEL CONTROL

/Kenneth R. Meloche, Warren; James G. McLeish, Sterling Heights, and Herbert A. Libkie, Romeo, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1984, Ser. No. 601,936
Int. Cl.³ B60G *17/04*
U.S. Cl. 280—6 R **3 Claims**



1. A level control system for a wheeled motor vehicle with

sprung and unsprung masses and an accessory the activation of which indicates the probability of an associated vehicle load change, the system having fluid power means activatable to level the sprung mass relative to the unsprung mass within a predetermined trim band, said system comprising:

sampling sensor means effective to indicate the height of said sprung mass relative to said trim band;

signal generating means responsive to said sensor means for a selected time period to periodically generate a signal indicating whether said sprung mass is above, within or below said trim band for said time period according to predetermined criteria;

means defining a service time period shorter than a predetermined activation time of said fluid power means which avoids overshoot in level adjustment, a cruise time period longer than the out-of-trim duration of a predetermined long highway feature and a decision time period of duration intermediate the service and cruise time period durations and longer than the period of sprung mass oscillation during vehicle movement;

means effective to initiate system operation with vehicle operation and select said decision time period;

means responsive to a predetermined number of consecutive decision time periods with no above-trim or below-trim signals to select said cruise time period;

means responsive to an above-trim or below-trim signal in a cruise time period to select said decision time period;

means responsive to an above-trim or below-trim signal in a decision time period to activate said fluid power means and select said service time period; p1 means responsive to a within-trim signal in a service time period to deactivate said fluid power means and select said decision time period;

sensor means effective to generate a signal whenever said accessory is activated; and

means responsive to a signal from said sensor means during a cruise time period to immediately initiate a decision time period, whereby fast reaction to a vehicle load change is effected.

4,540,189

STEERING SYSTEM FOR MOTORIZED CYCLES

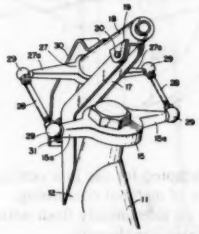
Norio Tanaka, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,814

Claims priority, application Japan, Jan. 25, 1982, 57-9775; Jun. 1, 1982, 57-80891[U]

Int. Cl.³ B62K *21/00*

U.S. Cl. 280—270 **9 Claims**



1. A steering system for a motorized cycle including a vehicle frame, a front fork steerably supported by said frame, and a front wheel integrally steerably suspended by said front fork, comprising:

a handlebar;

a first steering stem formed to be integrally rotatable with said front fork;

a second steering stem formed to be integrally rotatable with said handlebar;

connection means for operatively interconnecting said first and second steering stems with each other;

support means for supporting said first and second steering stems relative to said vehicle frame;

said support means including a support tube loosely fitted on and supporting said second steering stem, a head tube loosely fitted on and supporting said first steering stem and secured to said vehicle frame, and a stay member having a lower portion thereof secured to said head tube and an upper portion thereof supporting said support tube;

said support tube being vertically rockably pivoted to said stay member; and

a resilient means interposed between said support tube and said stay member.

4,540,190

BICYCLE FRAME

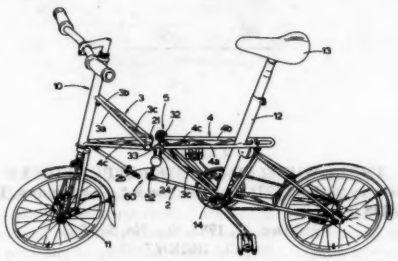
Alexander E. Moulton, Bradford on Avon, England, assignor to Alex Moulton Limited, Wiltshire, England

Filed Dec. 1, 1983, Ser. No. 556,936

Claims priority, application United Kingdom, Dec. 1, 1982, 8234199; Dec. 1, 1982, 8234233

Int. Cl.³ B62K *15/00*

U.S. Cl. 280—278 **7 Claims**



1. A frame for a bicycle having a head tube for housing a steering column and a seat tube surmounted by a saddle and having at its lower end a housing for a pedal crank axle, the frame comprising two beams extending between the head tube and the seat tube, said beams intersecting one another so that the two beams constitute a cruciform when viewed in side elevation, and including a tie extending, beneath the intersecting beams, between lower regions of the head and seat tubes, said beams each comprising twin peripheral tubes which are structurally interconnected by and spaced apart by a structural web extending between said tubes in each beam so that each beam is structurally efficient in the transverse plane.

4,540,191

STATIC DISCHARGE PREVENTION SYSTEM FOR A LARGELY NON-METALLIC FUEL TANK

John J. Hoch, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

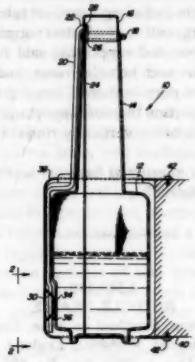
Filed Mar. 12, 1984, Ser. No. 588,614

Int. Cl.³ B60K *15/02*

U.S. Cl. 280—5 A **5 Claims**

1. A grounded fuel tank assembly comprising: a vehicle chassis; a fuel tank mounted to the chassis and including an elevated filler neck; said filler neck including at least an upper portion forming a sole electrical current conducting portion of said tank; a first conducting element means secured to said

upper portion of the filler neck and extending down into said tank; and a second conducting element means connected in



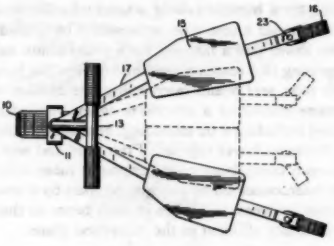
conducting relationship between said upper portion of the filler neck and the chassis.

4,540,192

THREF-WHEELED SCOOTER-TYPE VEHICLE

L. Harvey Shelton, 6971 Fords Station Rd., Germantown, Tenn. 38138

Filed Dec. 27, 1983, Ser. No. 565,903
Int. Cl.³ B62K *17/00*
U.S. Cl. 280—282 **6 Claims**



1. A scooter-type vehicle that can be propelled by the action of the rider, the vehicle comprising:

a front steering wheel;

a front steering column connected to the steering wheel and adapted to steer the same; and

a pair of rearwardly extending foot support frames connected to said front steering column in such a manner that said foot support frames are capable of independent sidewise swinging movement; and

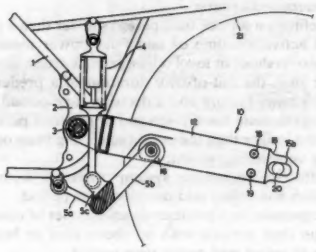
a pair of rear supporting wheels, each connected to a foot support frame at the portion thereof remote from said front steering column, said rear supporting wheels being connected to said foot support frames by means of swivel caster mountings so that lateral movements of said foot support frames propel said vehicle in a forward direction.

4,540,193

REAR MOTORCYCLE FORK

Azusa Noda, Tokyo; Nobuo Fujitaka, Niiza, and Masaru Fujisaki, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1983, Ser. No. 507,127
Claims priority, application Japan, Jun. 23, 1982, 57-106697
Int. Cl.³ B62K *25/04*
U.S. Cl. 280—284 **6 Claims**



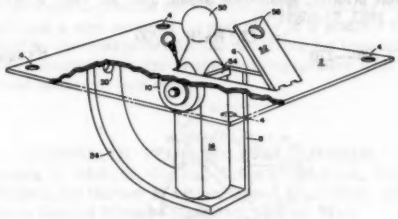
1. A rear fork for a motorcycle having a front end for attachment to a motorcycle and rear ends for mounting a wheel and being of approximate U-shape having rear fork arms characterized in that the rear fork arms are hollow and are formed of integrally molded fiber reinforced plastic and in that a metal end piece for receiving an axle is provided to each of said rear fork arms, said metal end piece having a configuration conforming to an end portion of the rear fork arm and locating projections abutting a portion of said end portion, said metal end piece being joined to an end portion of said rear fork arm.

4,540,194

TRAILER HITCH

Roy Dane, P.O. Box 42, Harrah, Wash. 98933

Filed Sep. 23, 1983, Ser. No. 535,113
Int. Cl.³ B60D *1/06*
U.S. Cl. 280—491 B **5 Claims**



1. A trailer hitch adapted for use in a vehicle having a bed for the transportation of material comprising:

a plate adapted to lie substantially flush with said bed, said plate having an aperture therein;

a hitch block extending through said aperture and having a connecting means at one end for connection to a trailer, said hitch block being journalled about an axis located sufficiently below said plate that when said hitch block is turned horizontally it lies completely below said plate, said hitch block having a longitudinal bore at the opposite end from said connecting means;

a pin slidably mounted in said bore, a spring in said bore urging said pin outwardly;

flexible means extending substantially longitudinally

through said block and having one end connected to said pin;

grip means on the opposite end of said flexible means from said pin; and

restraining means beneath said plate, said restraining means having one hole positioned vertically beneath said axis and a second hole positioned horizontally of said axis, said holes being spaced from said axis by such distances that they will receive the end of said pin when said block is in the proper position.

4,540,195

CROSS-COUNTRY SKI SOLE

Robert Smith-Johannsen, Incline Village, Nev., assignor to Ramu International, Incline Village, Nev.

Filed Feb. 23, 1983, Ser. No. 469,048

Int. Cl.³ A63C *5/04, 5/12*

U.S. Cl. 280—610 **12 Claims**

1. A composite polyethylene ski sole comprising polyethylene film, polyethylene particles having a higher hardness than the polyethylene film, and a plurality of polyethylene fibers extending from the working surface of the composite polyethylene ski sole at the interface of the particles and film, said fibers being regenerated when the surface of the ski sole is abraded on snow.

4. A method for making a multi-phase polyethylene structure comprising film-forming polyethylene and polyethylene particles having a higher hardness than the film-forming polyethylene and which polyethylene particles will not form a film under film-forming conditions which comprises:

(1) treating at least part of the surface of the polyethylene particles with a material which is incompatible with polyethylene or which will reduce the adhesion of the particles to the film-forming polyethylene,

(2) mixing the treated polyethylene particles with the film forming polyethylene, and

(3) forming a film of the mixture so that the treated polyethylene particles remain substantially intact to produce a multi-phase structure having polyethylene particles embeded in a film of polyethylene.

4,540,196

FOLDING CADDY

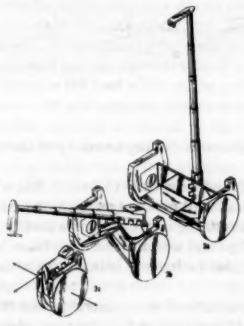
Max G. Paping, Culemborg, and Bjorn O. Goossens, Wassenaar, both of Netherlands, assignors to Maxilin B.V., Barneveld, Netherlands

Filed Feb. 14, 1983, Ser. No. 466,205

Claims priority, application Netherlands, Feb. 19, 1982, 8200687

Int. Cl.³ B62B *11/00*

U.S. Cl. 280—646 **17 Claims**



1. A foldable, single-axle caddy, comprising a foldable bottom (1) including at least two substantially rigid parts (7, 8) which are interconnected through first hinge means (9), each of the said parts (7, 8) swingingly carrying, through second hinge means, a wheel guard (4, 5) at its lower edge, while each wheel case (4, 5) is hinged through at least third hinge means to a rear wall (10, 11, 45, 46) via the said lower edge of said wheel guard (4, 5), said first and the second hinge means being substantially parallel to each other, while said third hinge means are substantially perpendicular to and disposed behind said first and the second hinge means, and a handle (6) which is connected to said rear walls (10, 11) via a fourth hinge means (29, 30, 51).

4,540,197

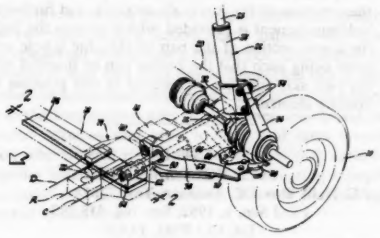
VEHICLE WHEEL SUSPENSION

Bernard J. Finn, Troy, and Ming-Chih Yew, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 332,766, Dec. 21, 1981, abandoned. This application Jul. 22, 1983, Ser. No. 516,034

Int. Cl.³ B60G *3/00*

U.S. Cl. 280—697 **4 Claims**



1. Wheel suspension for the sprung mass of a vehicle which includes a transversely opposite pair of road wheels, comprising, a pair of transverse control arms each carrying one of said wheels and swingably mounted at one side of the sprung mass on a generally longitudinally extending axis thereof, a primary suspension spring comprising an elastic beam extending transversely of the sprung mass proximate said control arms but spaced longitudinally of the sprung mass therefrom and having end portions projecting outboard of generally vertical planes containing the swing axes of said control arms, a pair of torsion rods extending on axes generally parallel but outboard said control arms swing axes and each connected at one end to a respective control arm and affixed at the other to an end of said beam, said rods being operative to carry to said beam forces deflecting said control arms relative the sprung mass, whereby the beam is adapted to bend under such forces about a spaced pair of nodal points located substantially inboard of said interconnection locations, and reaction mount means between each of the torsion rods and respective ones of the control arms operative to exert on the torsion rods intermediate their ends reaction forces counter to force couples developed by the elastic beam during asymmetric deflection of the control arms.

4,540,198

SKI-TRANSPORTING DEVICE

Hans Kyburz, Bruggweg 40, CH-4143 Dornach, Switzerland

PCT No. PCT/CH82/00079, § 371 Date Feb. 16, 1983, § 102(e) Date Feb. 16, 1983, PCT Pub. No. WO82/04401, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 17, 1982, Ser. No. 468,052

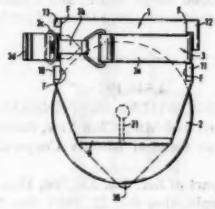
Claims priority, application Switzerland, Jun. 18, 1981, 4056/81

Int. Cl.³ A63C *11/10*

U.S. Cl. 280—814 **9 Claims**

1. A ski-transporting device, having a loosely and rotatably mounted roller having a lower wheel rim which is detachably

fitted to the end section of a pair of skis remote from the tips to permit the skis to be rolled along on the ground, wherein the roller is mounted in a holder of virtually U-shaped cross-section in such a way that two side cheeks of the holder cover the major part of the roller, the two side cheeks extend in the form of a tip downwards into the region of the lower wheel rim, to prevent lateral rolling away when the skis are put down



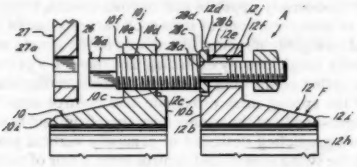
and wherein at least one side cheek, on its outside facing away from the roller, has stops, the position of which fits the contours of the lower ski sections, and furthermore a holding element is provided which secures the holder to the lower section of the pair of skis, the whole arrangement being such that the holder can be inserted between the two skis and can be secured in this position by the holding element.

4,540,199

JACK BOLT ASSEMBLY

David C. Neill, Box EE, Anahuac, Tex. 77514

Filed Sep. 1, 1982, Ser. No. 413,883
Int. Cl.[3] F16L *35/00*
U.S. Cl. 285—27 **6 Claims**



1. In a releasable flange assembly of the type having first and second flange members each adapted for attachment to make-up end portions of first and second flowlines, respectively, with said releasable flange assembly joining said first flowline in fluid communication with said second flowline when said first and second flange members are secured in a make-up union, and fluid cmmunication between said first and second flowlines being interrupted when said flange members are spread, the first and second flange members each having a corresponding number of aligned openings for receiving tightening bolts, at least one of said aligned openings in said first flange member being threaded, the improvement comprising a jack bolt assembly received in an aligned pair of said flange openings for securing, separating and aligning said flange members during make-up and spread operations, said jack bolt assembly having

a primary threaded shaft portion for threadedly engaging the threads in said at least one of the openings formed in the first flange member,

a tool engaging end formed with said primary threaded shaft portion for rotation of said jack bolt shaft as desired,

a radially engaging surface formed adjacent said primary threaded shaft portion, said radial engaging surface extending radially inwardly from said primary threaded shaft portion,

a thrust member receiving portion formed adjacent to said primary threaded shaft portion and said radial engaging surface, said thrust member receiving portion being aligned with said primary shaft portion and adapted to extend into the aligned opening formed in the second flange member;

a secondary threaded portion formed adjacent to and in axial alignment with said thrust member receiving portion and adapted to be disposed within the opening formed in the second flange member and adapted to extend outwardly therefrom;

a thrust member movably mounted on said thrust member receiving portion, said thrust member being disposed between the first and second flange members of the flange assembly, said thrust member abutting said radial engaging surface and the second flange member upon initial rotation of said primary threaded shaft portion, the engagement of said thrust member with the second flange member separating the first and second flange members of the flange assembly upon continued rotation of said primary threaded portion; and,

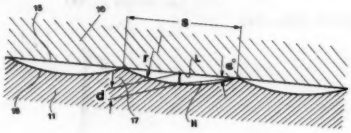
a securing member threadedly engaging said secondary threaded portion of said jack bolt member, said securing member releasably abutting the second flange member of the flange assembly for releasably securing the second flange member with the first flange member of the flange assembly upon threaded, tightening action between said securing member and the second flange member.

4,540,200

ROCK DRILL

Lars E. Larsson, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

PCT No. PCT/SE82/00021, § 371 Date Sep. 17, 1982, § 102(e) Date Sep. 17, 1982, PCT Pub. No. WO82/02735, PCT Pub. Date Aug. 19, 1982
PCT Filed Jan. 26, 1982, Ser. No. 420,243
Claims priority, application Sweden, Feb. 2, 1981, 8100767
Int. Cl.[3] F16L *55/00*
U.S. Cl. 285—332.4 **13 Claims**



1. In a percussion rock drilling assembly of the type comprising:

a drill bit mounted on a drill rod such that a first conical surface on said drill bit engages a second conical surface on said drill rod, the improvement wherein:

one of said first and second conical surfaces is harder than the other and includes a helically extending left-hand thread, and

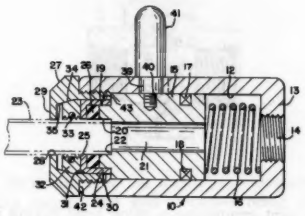
said other conical surface is generally smooth and sized to receive said one surface by a frictonal sliding fit so that a corresponding helical thread is formed in said other surface in response to shock waves generated during a percussion drilling operation.

4,540,201

TUBE CONNECTOR

William D. Richardson, Palos Park, Ill., assignor to Tuthill Corporation, Chicago, Ill.

Filed May 16, 1983, Ser. No. 494,616
Int. Cl.[3] F16L *17/04*
U.S. Cl. 285—101 8 Claims



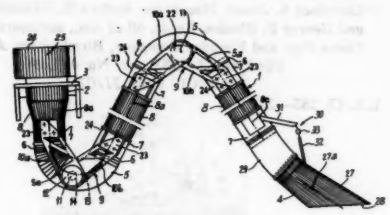
1. A tube connector for connecting a tube to a source of fluid pressure, said connector including a hollow body member defining an opening at one end to allow for insertion of a tube and defining an opening at the other end adapted to be connected to said fluid pressure source; a chamber defined internal to said body member; a piston disposed within said chamber adapted to move longitudinally within the chamber, said piston having opposite end faces and a fluid passage therethrough; extending between said opposite end faces thereof a first seal disposed between said piston and the internal wall of said chamber; so as to seal against the passage of fluid pressure therebetween a slot defined through the wall of said body member including a load position at one end and a test position at the other end; a piston actuator connected to said piston extending through and movable within said slot such that when said actuator is placed in said load position of said slot, said piston is secured against longitudinal movement relative to said body member and, when said actuator is moved from the load position to said test position, said piston is caused to move longitudinally relative to said body member toward said opening at said one end of said body member; tube gripping means disposed toward said opening at said one end of said body member a second seal disposed between said gripping means and said piston, said gripping means and second seal positioned so as to encircle the outer periphery of said tube when said tube is inserted into said connector; and resilient biasing means associated with said piston to urge said piston toward said gripping means and said second seal whereby when said piston actuator is placed in the load position, the piston is secured out of engagement with said gripping means and said second seal, when said piston actuator is placed in the test position, said biasing means exerts a first force against said piston causing it to actuate said gripping means into gripping engagement with the outer periphery of said tube with a first force and simultaneously causing said piston to engage said second seal forcing its inner periphery into sealing engagement with the outer periphery of said tube and, whereby upon positive pressurization of said chamber by said source of fluid pressure, the pressure acting against the piston exerts a second and supplemental force against said piston causing an increase in the gripping force exerted by said gripping means on said tube and simultaneously causing an increase in the force applied by said piston on said second seal thereby increasing the effectiveness of said second seal against the outer periphery of said tube.

4,540,202

ARTICULATED TUBULAR CONDUIT ARM FOR SUCKING GASEOUS FLUIDS

André Amphoux, 12, rue Jules Cèsar, 75012 Paris, and Jean M. Carbon, 1, rue des Vignerous, 95110 Sannois, both of France

Filed Feb. 8, 1982, Ser. No. 346,753
Claims priority, application France, Feb. 10, 1981, 81 02561
Int. Cl.[3] F16L *27/00*
U.S. Cl. 285—184 20 Claims



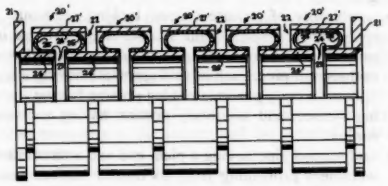
1. An artificial suction conduit for gaseous fluids, comprising at least two rigid tubes, a flexible sleeve disposed between and tightly connected to said tubes, mechanical articulation means comprising at least two arms rigidly connected one to each of said tubes an interconnected for pivoting about an axis transverse to the longitudinal axes of said tubes, and spring means connected between said arms to urge said arms towards a position wherein said rigid tubes are aligned with each other, said spring means being a helicoidal coil spring comprising turns coaxial with said pivot axis and free end portions rigidly connected to said arms.

4,540,203

ROLLING CUFF FLEXIBLE BELLOWS

Donald R. Lambert, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 425,139
Int. Cl.[3] F16L *27/10, 51/02*
U.S. Cl. 285—226 20 Claims



1. A flexible connector apparatus for interconnecting substantially rigid members and having at least one flexible assembly, and connector means connected to said flexible assembly adapted for connection with associated rigid members; said flexible assembly comprising:

a single flexible element having a torus-shaped cross-section defining a space therein and having a pair of spaced substantially flat end sections, a longitudinally extending substantially flat body section, and a pair of curved sections each interconnecting said body section with one of said end sections;

a pair of spaced members fixedly secured to said spaced substantially flat end sections of said flexible element; and

a back-up member positioned in contact with said substantially flat body section of said flexible element, said back-

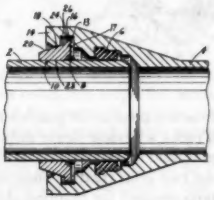
up member having a longitudinally extending length greater than said flat body section of said flexible element.

4,540,204

RESTRAINED PIPE JOINT

Billy J. Battle, Birmingham; Robert M. Graham, Bessemer; Lawrence S. Jones, Hueytown; Andrew B. Malizio, Pelham, and George F. Rhodes, Leeds, all of Ala., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Apr. 4, 1983, Ser. No. 481,690
Int. Cl.³ F16L *21/02*
U.S. Cl. 285—231 **4 Claims**



1. In combination a first pipe in locking, overlapping engagement with a second pipe and means to lock the two pipes together, said means comprising:

a. said first pipe having a bell portion, said bell portion having a radially, inwardly, circumferentially extending projection integrally mounted to said bell portion at one end of said first pipe, said projection forming one end of a circumferential groove, said projection having a first surface remote from said bell portion facing toward the interior of said first pipe and forming a first contacting surface; said projection further having a second surface connected to said first surface and extending radially of said bell portion to form one wall of said elongated circumferential groove, said projection having an arcuate, circumferentially shaped recess, said recess providing an opening into a portion of said elongated circumferential groove,

b. a plurality of arcuate shaped locking segments corresponding in shape to said arcuate shaped recess in said projection and conforming to the outer circumference of said second pipe, each of said segments having a leg portion and a body portion; said leg portion having a contacting surface, and said body portion having a contacting surface,

c. said second pipe having a plain end and a circumferential weldment protruding from its outside surface near said plain end,

d. said locking segments being installed through said recess and into slidable engagement with the outside surface of said plain end of said second pipe between said weldment and said projection, and thereafter moved out of alignment with said recess, after said contacting surface of said leg portions abut with said first contacting surface of said projection and

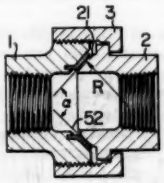
e. said body portion of said locking segments extending into said elongated circumferential groove in the bell portion of said first pipe, whereby said contacting surfaces of said leg portions of said locking segments abut with said first contacting surface of said projection and said contacting surface of said body portion of said locking elements is adapted to abut with said second contacting surface of said projection.

4,540,205

UNION JOINT

Nobuyuki Watanabe, and Nobuo Wanda, both of Kuwana, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,635
Claims priority, application Japan, Jun. 11, 1982, 57-86869[U]
Int. Cl.³ F16L *19/02*
U.S. Cl. 285—329 **1 Claim**



1. A union joint comprising a union head having a male screw thread formed on the outer peripheral surface of an axial inner end portion thereof and provided at its end with an annular seat member made of a non-ferrous material, a union tail piece having a collar on the outer peripheral surface of the inner axial end thereof and provided at its end with a spherical sealing surface, and a union nut provided at its front inner portion with a female screw thread and at its rear inner periphery with an inwardly projecting jaw, said union nut being adapted to be screwed to said union head through screwing engagement between said female screw in said union nut and said male screw on said union head while keeping said jaw of said union nut in engagement with said collar of said union tail piece thereby to bring said seat member on said union head and said sealing surface on said union tail piece into close contact with each other, said union head being provided in its axially inner end portion adjacent to its inner periphery with an annular groove directed axially outwardly, the large diameter side of which is cylindrical and the smaller diameter side of which is inclined toward the inner periphery, said annular seat member being inserted into said annular groove and being caulked in said annular groove by means of knurlings formed on an inner peripheral side of the inner wall of said annular groove over its whole circumference, and wherein an angle of the annular seat member's surface contacting the sealing surface of said union tail piece is formed in a taper angle of between 95° and 110° diverging toward the axially inner end of said union head.

4,540,206

ADJUSTABLE DRAW LATCH

William R. Frame, Brookhaven, and James H. Vickers, Middletown, both of Pa., assignors to Southco, Inc., Concordville, Pa.

Filed Apr. 30, 1984, Ser. No. 605,385
Int. Cl.³ E05C *5/02*
U.S. Cl. 292—66 **11 Claims**

1. An adjustable draw latch for latching together two closure members, said latch comprising:

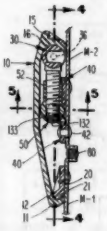
a. a keeper adapted to be secured to one of said closure members;

b. a latch base bracket adapted to be secured to the other of said closure members, said bracket having a central opening therein and having a pair of bearing blocks, one on each side of the opening;

c. a pivot nut having an internally-threaded sleeve portion projecting into said central opening of said bracket, said nut having at right angles to its sleeve portion a cylindrical body portion having stub pivot shafts projecting from opposite ends on the center axis thereof and received within said bearing blocks;

d. a T-shaped stud member having a cylindrical cross head and an externally threaded stud portion projecting from

said cylindrical cross head at right right angles thereto, said externally threaded stud portion being received within the internally threaded sleeve portion of said pivot nut;



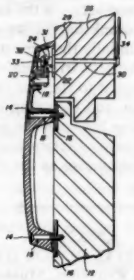
e. a latch cover having depending sidewalls on opposite sides thereof and said sidewalls being provided with means near one end for pivotally retaining the ends of the cylindrical cross head of said T-shaped stud member, said latch cover having a hook portion at the other end for detachably engaging said keeper.

4,540,207

REFRIGERATOR DOOR PULL AND LATCH ASSEMBLY

Daniel A. Klasen, Hudson, and John F. Denucci, Roberts, both of Wis., assignors to The Vollrath Company, Sheboygan, Wis.

Filed Aug. 29, 1983, Ser. No. 526,995
Int. Cl.³ E05C *15/02*
U.S. Cl. 292—341.17 **4 Claims**



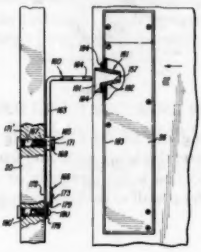
1. A refrigerator door pull and latch assembly comprising a door handle secured to a door, a locking mechanism disposed in said handle for locking the door to a door frame, said locking mechanism including a lock mounted in said door handle, a locking member including a semi-circular end portion connected to said lock and a locking member receiving means secured to said door frame, said receiving means comprising a strike bolt assembly defining a groove constructed and arranged to receive said semi-circular end portion when the locking mechanism is locked and including a safety release member for moving the strike bolt assembly to a position whereby the locking member is free of said lock member receiving means whereby the door can be opened independent of said lock.

4,540,208

POINT-OF-EGRESS CONTROL DEVICE FOR SAFELY SECURING EMERGENCY EXIT DOORS

Emanual L. Logan, Jr., Arlington, Va.; Walter M. Sommers, and J. William Walsh, both of Baltimore, Md., assignors to Reliable Security Systems, Inc., Cockeysville, Md.

Continuation-in-part of Ser. No. 148,403, May 9, 1980, Pat. No. 4,354,699, and Ser. No. 263,955, May 15, 1981,. This application Sep. 27, 1982, Ser. No. 423,523
Int. Cl.³ E05B *47/00*
U.S. Cl. 292—341.19 **5 Claims**



1. In a security device for securing a closure member to a frame member, the security device comprising:

bolt mounting means on one member, bolt means within the bolt mounting means for movement between a latched and an unlatched position;

keeper means having a projecting strike portion which strike portion engages with the bolt means to latch the closure, the keeper means further including a mounting portion wherein the mounting portion of the keeper is a resilient shank having one end free and having the strike portion at the other end, and wherein the means for loosely securing the mounting means includes a first bracket loosely fitting over the shank between the free end and strike portion, allowing the shank to move laterally within the bracket, and a second bracket engaging the shank adjacent the free end thereof, and

keeper guide means mounted adjacent the bolt, the keeper guide means including an inner opening aligned with the bolt and corresponding in cross-section to the strike portion of the keeper and further including beveled surface means diverging from the inner opening toward an outer opening larger than the inner opening, wherein the strike portion of the keeper is channeled by the keeper guide means through the inner opening into latching engagement with the bolt upon closing the closure member with respect to the frame member, whereby any misalignment between the keeper and the bolt is compensated for by the loose mounting of the keeper and the beveled guide surface means.

4,540,209

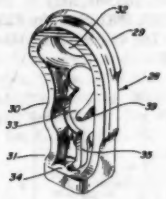
RIGGING METHOD AND HOOK THEREFOR

Stuart E. Cody, Sandy, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Aug. 15, 1983, Ser. No. 523,112
Int. Cl.³ B66C *21/00*
U.S. Cl. 294—74 **4 Claims**

1. A logging hook comprising a unitary metal member being defined by front, rear, side, top and bottom walls and having a top eye portion, an intermediate threading portion and a bottom socket portion, a generally S-shaped opening in said intermediate threading portion extending therethrough from said front to said rear walls, an enlargement at the upper end of said opening providing a path for threading a ferrule-equipped choker line through said opening, a slot in said bottom socket portion extending from said front wall and partway across said

bottom wall, said slot communicating with said S-shaped opening and providing a further path for said choker line to pass from being threaded through said S-shaped opening into said bottom socket portion to seat said choker line ferrule in said socket, said top eye portion having a sliding way for a logging



line with said sliding way having a threading axis extending at an acute angle to said threading path, said front and rear walls of said top eye portion being generally arcuate to define a generally convex front wall to facilitate bunching of said hooks on said drop line.

4,540,210

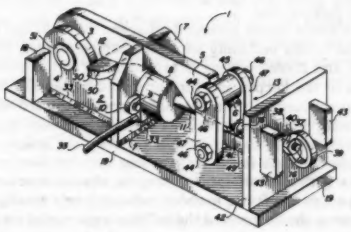
CABLE RELEASE MECHANISM

Gregory L. Smith, P.O. Box 1196, West Monroe, La. 71291

Continuation-in-part of Ser. No. 407,574, Aug. 12, 1983, abandoned. This application Oct. 24, 1983, Ser. No. 544,951

Int. Cl.[3] **B63B** *21/60;* **B66C** *1/34*

U.S. Cl. 294—82.34 **20 Claims**



1. In a cable release mechanism having a base, a pair of hinges in upward-standing relationship on the base, a pelican hook pivotally mounted on the hinges and a keeper ring in slidable cooperation with the base and normally engaging the free end of the pelican hook to retain a towing cable against the pelican hook, the improvement in combination therewith comprising a fluid-operated cylinder carried by said base and a piston cooperating with said cylinder in reciprocating relationship and having one end extending from said cylinder, said one end of said piston in contact with the keeper ring for selective disengagement of the keeper ring from the free end of the pelican hook responsive to fluid activation of said cylinder and release of the cable from the pelican hook and further comprising elongated connecting means having one end secured to the keeper ring on the opposite side of the keeper ring from said piston and bias means in cooperation with said connecting means for biasing the keeper ring against said piston.

4,540,211

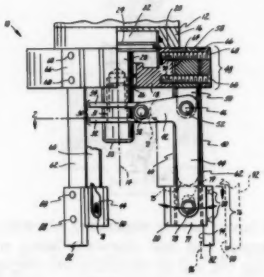
JAW ASSEMBLY

Gregory J. Masserang, Clarkston, Mich., assignor to Android Corporation, Auburn Hts., Mich.

Filed Feb. 2, 1983, Ser. No. 463,229

Int. Cl.[3] **B25B** *5/04*

U.S. Cl. 294—88 **20 Claims**



1. For use with a work arm which moves workpieces from one station to another, a jaw assembly for releasably gripping the workpieces, said jaw assembly comprising a jaw element which is displaced radially of the axis of the jaw assembly to grip and release workpieces, said jaw assembly including a head via which it is adapted to be mounted on the work arm and an actuator for operating the jaw assembly, said jaw assembly having the improvement which comprises said actuator being displaceable axially of the jaw assembly to operate the jaw assembly, means mounting the jaw element on the head and operatively coupling the jaw element with the actuator comprising a crank, means pivotally mounting the crank on the head, the crank and its pivotal mounting being arranged and constructed such that axial motion of said actuator causes said crank to pivot about its pivotal mounting and at its point of operative coupling with said jaw element to swing in an arc generally radial of the axis of the jaw assembly to impart generally radial motion to the jaw element for gripping a workpiece, and resilient means disposed between the head and jaw element and cooperable with the crank and the jaw element to maintain the jaw element in substantially the same predetermined orientation for gripping workpieces irrespective of the amount of radial displacement imparted to the jaw element by the crank for gripping a workpiece, and including an axial lost motion connection in the coupling between the jaw element and the head to take up a component of relative axial motion between the crank and said resilient means as the crank is operated by the actuator.

4,540,212

INDUSTRIAL ROBOT HAND

Hajimu Inaba, Hino, and Ryo Nihei, Musashino, both of Japan, assignors to Fanuc Limited, Hino, Japan

PCT No. PCT/JP82/00336, § 371 Date Apr. 25, 1983, § 102(e) Date Apr. 25, 1983, PCT Pub. No. WO83/00652, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 25, 1982, Ser. No. 491,198

Claims priority, application Japan, Aug. 25, 1981, 56-132073

Int. Cl.[3] **B66C** *3/16*

U.S. Cl. 294—88 **2 Claims**

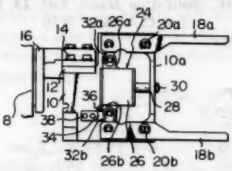
1. An industrial robot hand having swing fingers for gripping a work and adapted to be joined to the free end of a wrist unit comprising:

a pair of opposed rigid unitary swing fingers pivotally mounted to a swing finger actuator mounted on a hand base member attached to said wrist unit,

the swing finger actuator including a hydraulic cylinder having a piston rod fastened to said hand base member and

adapted to cause swing fingers to operate by the sliding movement of the cylinder tube,

said swing fingers having a U-shaped cross section and being formed from sheet metal by a pressing process,



a position detecting means for detecting a terminal position of the sliding movement of said actuator cylinder tube including a signal whereby the fully closed position of said swing fingers is indicated by a signal; and

the pivotal connections of said swing fingers being made by chain pin links.

4,540,213

VEHICLE CARGO ORGANIZER ASSEMBLY

John E. Herlitz, Farmington Hills, and Carl A. Cameron, Detroit, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 27, 1983, Ser. No. 545,831

Int. Cl.³ B60R *11/00*

U.S. Cl. 296—37.5 **1 Claim**

1. In a motor vehicle having at least one seat, door means closing a generally rectangular rear access opening having top, bottom and side edges, a rear cargo compartment having a cargo floor extending from a location behind the rearmost seat to said access opening, at least a portion of said cargo floor spaced a predetermined longitudinal distance from said rear access opening having three or more longitudinally extending, equally spaced, substantially parallel forward cargo skid slat members fixedly secured thereto; each said forward cargo skid member having a generally flat rectangularly shaped cross-section, an equal number of identical, substantially parallel, equally spaced aft cargo skid slat members, each said aft cargo skid slat member having front and rear ends and normally extending longitudinally on said cargo floor said predetermined distance, each said aft cargo skid slat member aligned with an associated forward cargo skid slat member with its rear end adjacent said rear access opening bottom edge and its front edge juxtaposed an associated aligned forward cargo skid member rear edge, such that each said rear cargo skid slat member normally functions in association with its aligned forward cargo skid slat member to facilitate the movement of cargo into and out of said compartment rear access opening, hinge means pivotally supporting the rear end of each said aft cargo slat member at respective points on said floor such that said aft cargo skid slat members pivot about a common transverse axis, a transverse cross-rail interconnecting the front ends of each said aft cargo skid slat member, said cross-rail having a single flexible tie member connected at each end thereof, each said tie member having a loop formed at its free end, said aft cargo skid slat members and said cross rail defining a rack operable for pivotal movement about said transverse axis in an upward direction from said cargo floor, wherein each said tie member loop is adapted to be removably secured to its associated bracket member, said tie members holding said rack in a raised position with each said aft cargo skid slat member defining a predetermined acute angle with said cargo floor, whereby a cargo receiving space is provided between adjacent raised aft cargo skid slat members and said cross rail, said aft cargo skid slat members and said cross-rail together with said door means in its closed position operative to maintain cargo placed in said cargo receiving spaces in an upright position on said cargo floor during operation of the vehicle.

4,540,214

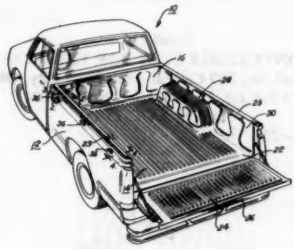
TRUCK BED LINER SECURING FIXTURE

James A. Wagner, Bristol, Ind., assignor to LRV Corporation, Elkhart, Ind.

Filed May 21, 1984, Ser. No. 612,412

Int. Cl.³ B62D *33/02*

U.S. Cl. 296—39 R **14 Claims**



1. The combination of a truck bed having side walls with a protrusion on the inner side spaced downward from the upper edge and an inwardly extending top flange with a downwardly extending lip, a liner for the bed having side walls positioned along the inner side of the bed side walls and adjacent thereto, and a plurality of fixtures slidably securing the liner side walls to the respective bed side walls, each fixture including a body disposed beneath the respective bed side wall flange and having a horizontal groove for slipping over the protrusion on the bed side walls, and an upper inner corner for seating against the inner side of said lip for holding said fixture between said protrusion and said lip, and a screw-like securing means extending through the adjacent liner side wall into said body to hold the respective side wall against said body.

4,540,215

LOCK SYSTEM FOR REMOVABLE AUTOMOBILE ROOF PANEL

Ralph M. Swearingen, 5444 Peterson La., Dallas, Tex. 75240

Filed Mar. 16, 1983, Ser. No. 475,917

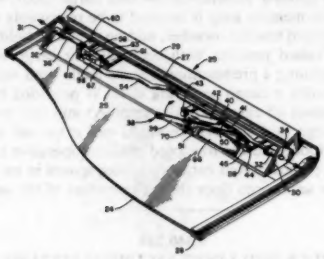
Int. Cl.³ B60J *7/18*

U.S. Cl. 296—218 **5 Claims**

5. An anti-theft lock assembly for a removable automobile roof panel, said panel including a frame adapted to support a latch mechanism for releasably latching said panel in a predetermined position in an opening in an automobile roof, said latch mechanism including a lever pivotally mounted on said frame and connected to latch means for moving said latch means between latching and release positions,

said lock assembly including a member supported on said frame by fastener means located so as to be covered by said lever in the latching position of said lever to prevent access to said fastener means, and said lock assembly

including a lock member projecting into a position to prevent movement of said lever to the release position in a first position of said lock member, said lock member



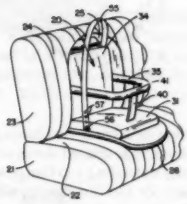
being movable by key means inserted in said lock assembly to move said lock member to permit movement of said lever.

4,540,216

CONVERTIBLE SEAT FOR VEHICLES

Karl D. Hassel, Sr., 369 Central Ave., Plain City, Ohio 43064

Filed Jul. 21, 1983, Ser. No. 515,804
Int. Cl.[3] A47C *15/00*
U.S. Cl. 297—238 **9 Claims**



1. A convertible seat for a vehicle comprising:

a. an adult size seat constructed on a main frame that is attached to the vehicle including a substantially horizontal cushion for support when a person is seated, juxtaposed and meeting a substantially vertical backrest with a back support surface, the back support surface having an aperature as an entrance to a cavity therein, with the aperature having a closure means fastenable at the surface of the backrest; and

b. a foldable child's size seat attached to the main frame within the cavity including a second cushion attached to the main frame and pivotable thereon from a position substantially vertical within the cavity when folded to a position substantially horizontal when unfolded within and outside the cavity, the cushion being juxtaposed and meeting a substantially vertical second backrest with a back support surface attached to the main frame, the cushion being foldable to a position adjacent to the second back rest when in folded position, and

an armrest guard encircling the second cushion position when unfolded substantially paralled therewith, attached to and pivotal from the second backrest surface when unfolded, and substantially vertical when folded,

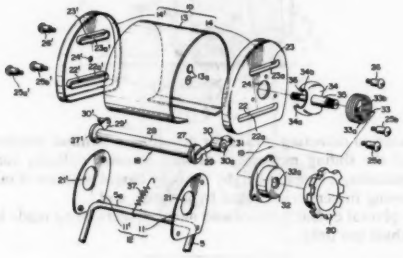
the second cushion and armrest guard being pivotal, enclosed in the cavity, and covered by the closure means, in the folded position.

4,540,217

HEADREST DEVICE FOR A VEHICLE SEAT

Hiroshi Suzuki, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1983, Ser. No. 522,585
Claims priority, application Japan, Aug. 13, 1982, 57-140685
Int. Cl.[3] A47C *7/36*
U.S. Cl. 297—391 **8 Claims**



1. A headrest device which is mountable to a stay means extending from the top of a backrest of a vehicle seat, said headrest comprising the following elements, the terms vertical, horizontal, upper and lower being used on the assumption that the headrest is attached to the stay means extending from the backrest of the vehicle seat when the backrest is in its essentially vertical orientation,

a stationary frame portion, said stationary frame portion including (a) first and second spaced apart plates fixedly attachable to said stay means so as to be vertically oriented, said first and second plates having corresponding elongated openings therein whose elongated dimensions are vertically oriented and said first and second plates defining facing inner sides and non-facing outer sides, and (b) at least one upper guide projection and at least one lower guide projection extending away from the outer sides of each of the first and second plates from respective points above and below the elongated openings therein,

a movable frame portion, said movable frame portion including (a) first and second spaced apart side panels which are respectively positioned adjacent the outer sides of said first and second plates, each of said first and second side panels including a horizontal upper guide groove through which at least one upper guide projection from the associated plate extends, a horizontal lower guide groove through which at least one lower guide projection from the associated plate extends, and a hole located between the upper and lower guide grooves, and (b) a central panel extending between said first and second side panels,

a braking mechanism, said braking mechanism including (a) an outer case fixedly secured to the first side panel of said movable frame portion so as to cover the hole therein, said outer case including an aperture therein and an inner peripheral surface, (b) an inner case rotatably positioned within said outer case, said inner case defining two engagement edges and including an operating shaft which projects toward the hole in said first end panel and an actuating shaft which extends through the aperture in said outer case, and (c) a coil spring positioned between said inner case and said outer case, said coil spring having engagement portions at its opposite ends which are adapted to contact a corresponding engagement edge of said inner case so as to allow the coil spring to be brought in pressure contact with the inner peripheral surface of said outer case, and

an eccentric cam mechanism which is capable of moving said movable frame portion forward and backward with respect to said stationary frame portion, said eccentric cam mechanism including (a) first and second disc ele-

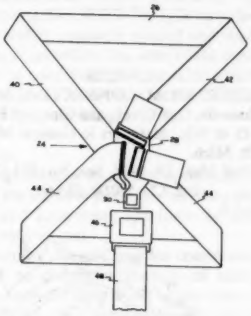
ments which are respectively located within the elongated openings in said first and second plates, (b) a connecting tube extending between said first and second disc elements, (c) a first support arm connected to said first disc element, said first support arm including a base which is rotatably positioned in the hole in said first panel, and (d) a second support arm connected to said second disc and having a free end which is rotatably positioned in the hole in said second side panel.

4,540,218

SAFETY BELT SYSTEM FOR CHILDS CHAIR

Rudy V. Thomas, Sterling Heights, Mich., assignor to Allied Corporation

Filed Jun. 6, 1983, Ser. No. 501,325
Int. Cl.³ A47D *13/08, 15/00*
U.S. Cl. 297—467 **6 Claims**



1. A safety belt system for a chair having a seat and a back comprising:

a latch having an entrance slot for receiving an anchor plate;

a first length of seat belt webbing having one end attached to the chair's seat and the other end attached to said latch;

an anchor plate having a tongue adapted to be received in said latch and locked therein, said anchor plate having a webbing slot provided along one edge thereof, said webbing slot having an open end adjacent to said tongue and received in said entrance slot when said tongue is inserted into said latch; and

a second length of seat belt webbing slidably supported from opposite sides of the chair's seat and back, the ends of said second length of seat belt webbing connected to said anchor plate and an intermediate portion of said second length of seat belt webbing intermediate said chair's seat and back, removably received in said webbing slot.

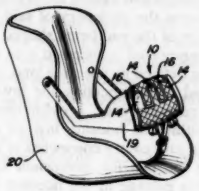
4,540,219

INFANT SAFETY SEAT ATTACHMENT

Christine L. Klinger, 515 Rebecca, Fayetteville, Ark. 72701

Filed Oct. 13, 1983, Ser. No. 541,417
Int. Cl.³ A47C *7/62*
U.S. Cl. 297—487 **5 Claims**

1. An activity cover of sheet material for wrapping around a front portion of an infant's seat and the like to provide amusement for the infant, releasable securing means on the cover for retaining the cover in wrapped around condition, at least one infant's amusement item, and means for releasably attaching the item to a surface of the cover which is accessible to an infant occupying the seat, wherein the releasable securing means comprises strips of friction fastener material on opposite surfaces of the cover, and wherein at least one of said strips on one surface of the cover is extended in relation to a cooperating strip on the other surface of the cover to provide the means for releasably attaching the amusement item to the cover, the amusement item also having a strip of friction fastener material



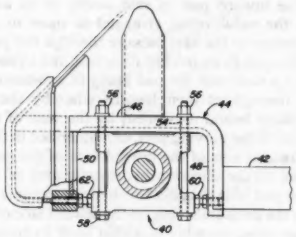
for releasable attachment to the extended portion of said at least one strip.

4,540,220

MEANS OF SECURING AN AXLE TO FRAME

Kenneth M. Roeth, and Gerald J. Ihm, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 6, 1983, Ser. No. 529,817
Int. Cl.³ B60B *35/00*
U.S. Cl. 301—125 **2 Claims**



1. A improved means of mounting a transverse axle to the frame of a vehicle, said transverse axle having a differential casing and concentric outwardly and oppositely extending cylindrical sections, wherein the improvement comprises; said frame having a plurality of transversely aligned wells, each of said wells having a horizontally extending top wall and spaced-apart vertical sidewalls;

a plurality of mounting members formed on said cylindrical section of said transverse axle each of which is aligned to be received in partial abutting relationship to said top wall and in spaced apart relationship to said side walls of said respective wells, and each of said mounting members having a plurality of side surfaces located generally below the center of said respective cylindrical section opposite said side walls of said respective well; and rotational load transfer means for providing rigid communication between said surface of said mounting members and said respectively oppositely aligned sidewalls of said respective wells such that rotational loading of said transverse axle is transmitted to said side walls of said wells by said rotational load transfer means.

4,540,221

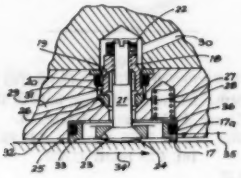
SELF REGULATING HYDROSTATIC PAD BEARINGS

Hugh I. Frazer, Lower Portland, Australia, assignor to Ifield Engineering Pty. Limited, New South Wales, Australia

Filed May 26, 1983, Ser. No. 498,454
Claims priority, application Australia, Jun. 2, 1982, PF4259
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—5 R **5 Claims**

1. A hydrostatic pad or slipper bearing for supporting a moving part, comprising a stationary housing having a cylin-

drical recess in a face thereof, a bearing pad having a periphery, an inward face and an outward face, the inward face of the pad having an effective hydrostatic area, said pad fitting closely in said recess and axially moveable therein, liquid sealing means between the periphery of said pad and said recess, the outward face of the pad being shaped to bear on the moving part to be supported, a recessed area on the outward face of the pad being defined by a sealing land, there being a passage through the pad communicating the inward face of the pad with the said recessed area, a cylindrical cavity having an inward part within the housing inward of the pad, a valve assembly within said cavity connected in a manner that is free of backlash to the pad for movement of the valve thereof therewith, a first passage in the housing for supply of liquid under pressure to the valve assembly, a second passage connecting the inward part of said cavity to an area of lower pressure, the valve being arranged to open to admit liquid under pressure to the said passage through the pad on movement of the pad in an inward direction, the cylindrical recess formed by a wall and the pad being of substantially uniform diameter throughout their lengths whereby the pad is supported against lateral movement by the wall of the recess at points close to the moving part, characterized in that the effective hydrostatic area of the inward face of the pad is substantially equal to the effective hydrostatic area of the outward face of the pad plus the effective hydrostatic area of the valve subject to the pressure acting on the inward face of the pad and in that the valve assembly is within itself hydrostatically balanced with respect to the pressure in said first passage whereby the pad and valve assembly are hydrostatically balanced.



4,540,222

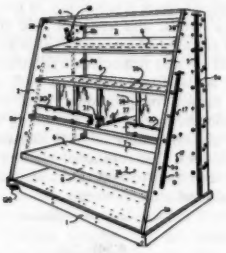
CABINET STRUCTURE FOR STORING, DISPLAYING AND INDEXING

Alfred A. Burrell, 10223-133th St., Edmonton, Alberta, Canada

Filed Feb. 28, 1983, Ser. No. 470,322

Int. Cl.[3] A47F *5/10*

U.S. Cl. 312—257 R **25 Claims**



2. A cabinet structure for storage or display comprising a rectangular base to be horizontally positioned on a support surface, spaced vertical sides and a back and top, and a plurality of shelves extending between said spaced sides, said vertical sides being inclined on the front, rearwardly tapering toward the top, and being made of rigid sheet material and having therein a series of vertically spaced horizontal rows of regularly positioned holes, bolt fastening means passing through said holes to co-operate with ends of said shelves to releasably support said shelves in a variety of horizontal positions, at least one of said shelves having two complementary full-length sections extending between said sides and being in telescopic sliding relation to each other to permit said one shelf to be expandable in width from front to back, both sections of each expandable shelf having depending ends for attachment to the cabinet sides, and wherein the rear section has a lower part of the depending ends thereof each provided with an offset step and a front section has an inner portion of the depending ends thereof of the same depth as the upper part of the rear section ends and provided with an inturned flange that normally rests on the outwardly offset step of said rear section so that the respective front section ends and the lower part of the rear section ends are coplanar.

4,540,223

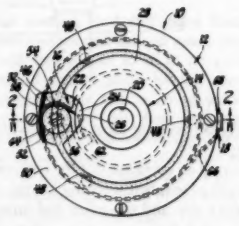
POSITIVE ELECTRICAL CONNECTING MECHANISM

Joseph M. Schmerda, Oak Creek, and Clarence F. Piojda, Hales Corners, both of Wis., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 19, 1984, Ser. No. 591,176

Int. Cl.[3] H01R *39/00*

U.S. Cl. 339—3 S **1 Claim**

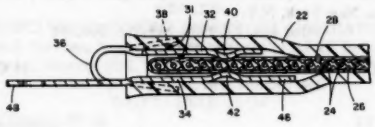


1. An electrical connecting mechanism comprising an outer shaft member, an inner shaft member, said outer and inner shaft members supported for relative rotary movement about a common axis and having an annular space therebetween, a carrier member in the form of a flat washer located in said space between said outer and inner shaft members and supported for rotation relative to said outer and inner shaft members, a roller mounted on said carrier member, an arcuate groove formed in said carrier member adjacent said roller, three pin-like members rigidly connected to and circumferentially equally spaced about said carrier member for preventing movement thereof along said common axis, a single flexible ribbon-like cable electrically and mechanically connected at one end to said outer shaft member and electrically and mechanically connected at the other end to said inner shaft member, said cable having a length greater than the circumference of the inner shaft member and having a portion intermediate said one end and said other end of said cable located in said arcuate groove so that rotation of said inner shaft member relative to said outer shaft member in one direction causes said cable to drive said carrier member through said groove in the same direction while the cable winds around said inner shaft member, and rotation of said inner shaft member relative to said outer shaft member in a direction opposite to said one direction causes the cable to drive said carrier member through said roller and to unwind from said inner shaft member while being guided by said roller into engagement with said outer shaft member along the inner surface thereof.

4,540,224
GROUNDING CLIP FOR USE WITH SHIELDED, JACKETED FLAT CABLE

Ronald R. Maros, Itasca, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 23, 1983, Ser. No. 525,639
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 R **16 Claims**



1. A one-piece resilient metallic grounding clip for use with a shielded, jacketed flat cable of the type including (1) an array of generally parallel, regularly spaced and coplanar conductors, extending intermediate the sides of the cable and embedded in a layer of insulation, (2) a metallic shield surrounding said conductors, and (3) an outer sheath of flexible insulative material; said clip comprising:

a first arm;

a second arm;

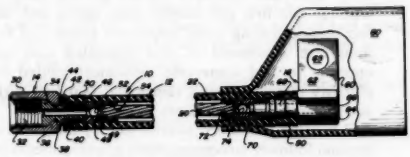
a web joining said arms and defining therewith a channel for receiving the shielded portion of the flat cable, the spacing between said arms being less than the thickness of said shielded portion; and

an ear extending from said web for cooperating with one of said arms to deform a portion of said outer sheath whereby, upon forming a slit in the outer sheath at one side of the cable, said arms can be moved from said side to flank said shielded portion to compressively hold said shielded portion therebetween, each arm comprising a jaw, the jaws cooperating to compressively engage said shielded portion, at least one of said arms comprising an extension from its jaw for deflecting, away from the shielded portion, the portion of said sheath ahead of said jaw during application of said clip.

4,540,225
SWIVEL CABLE COUPLING FOR AN AIR,CARBON-ARC CUTTING AND GOUGING TORCH

David E. Johnson, Pataskala, and Kenneth E. McCall, Lancaster, both of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Sep. 7, 1983, Ser. No. 529,916
Int. Cl.³ H01R *35/00*
U.S. Cl. 339—16 RC **10 Claims**



1. A swivel coupling comprising in combination:

a connector having first means to fasten said swivel coupling to a tool and second means including a bearing surface to receive a retainer for rotation relative to said connector;

a retainer having a bearing surface complementary to the bearing surface of said retainer disposed for rotation relative to and held by said connector, said retainer including means to position a cable coupling in relation to a but spaced apart from said connector;

a resilient washer disposed between said connector and said means on said retainer;

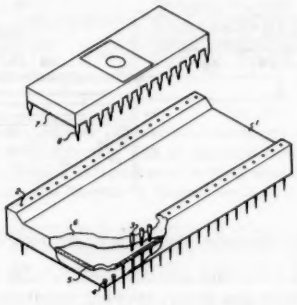
a cable coupling adapted to hold an elongated electrically insulated conduit and an elongated electrically conductive conductor disposed within said conduit in spaced relation whereby when said bearing surfaces of said connector and said retainer are assembled for functional rotation, said resilient washer is positioned and said cable coupling is fixed to said retainer said retainer and said connector can rotate relative to one another without separation of the bearing surfaces; and

means to fasten said conduit and said conductor to said coupling.

4,540,226
INTELLIGENT ELECTRONIC CONNECTION SOCKET

Raymond W. Thompson, Sugarland; Navinchandra Kalidas, Houston; John H. Abbott, Missouri City, and David S. Laffitte, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 3, 1983, Ser. No. 455,183
Int. Cl.³ H01R *23/72*
U.S. Cl. 339—17 CF **6 Claims**



1. An electronic connection socket for connection of an external electronic package, said socket comprising:

a first circuit board **(11)** having a plurality of first connection holes **(22)**, a first central aperture **(20)** and a plurality of connection fingers **(21)** selectively disposed between said first connection holes and the perimeter **(23)** of said first central aperture;

a semiconductor electronic device **(25)** disposed in said first central aperture of said first circuit board having a plurality of bonding pads **(27)** connected to selected connection fingers at said perimeter of said first central aperture by bonding wires **(28)**;

a plurality of first interconnection means **(4)** aligned with said first connection holes for connection of said socket to external electronic devices;

a plurality of second interconnection means **(3)** aligned with said first connection holes for connection of said socket to the connection pins of an external electronic package;

a plurality of third interconnection means **(56, 58)** aligned with said first connection holes for selectively connecting said connection fingers, said first interconnection means and said second interconnection means;

a second circuit board disposed in a plane parallel to the plane of said first circuit board having first and second surfaces, a plurality of second connection holes **(33)** aligned with said first connection holes, a second central aperture **(31)** aligned with said first central aperature, a plurality of plated through holes **(39)** connecting said first and second surfaces of said second circuit board, a plurality of first surface connection fingers **(30)** disposed on said first surface of second circuit board and connecting at

least one of said second connection holes and one of said plated through holes, at least one of said first surface connection fingers having portions disposed near the periphery of said second central aperture and bonded to said bonding pads of said semiconductor integrated device and a plurality of second surface connection fingers (**36, 37**) disposed on said second surface and connecting at least one of said second connection holes and one of said plated through holes;

an insulating layer (**53**) disposed between said first circuit board and said second circuit board; and

a body (**6**) of nonconducting material surrounding and encapsulating said first circuit board, said second circuit board, said semiconductor electronic device and said first, second and third interconnection means.

4,540,227

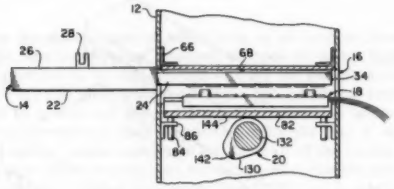
TEST EQUIPMENT INTERCONNECTION SYSTEM

Arthur Faraci, Hauppauge, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 21, 1984, Ser. No. 592,002

Int. Cl.[3] **H01R** *13/631*

U.S. Cl. 339—17 F **11 Claims**



1. An interconnection system for electronic equipment comprising:

a plug cartridge assembly having a body member and a planar plug portion extending therefrom, electrical connectors mounted on said body member in electrical circuit with flat, flexible, spaced-apart electrical conductors which form a first conductor terminus array on a surface of said plug portion, and alignment means on said plug portion associated with said first conductor terminus array;

a receptacle module assembly mounted in electronic equipment and having a recess therein for receiving said plug portion, said recess having a planar first wall and side walls, and a platen defining a second planar wall of said recess, said platen being arranged for movement towards and away from said first wall;

a planar connector assembly mounted on said platen, said planar connector assembly having flat, flexible spaced-apart electrical conductors which form a second conductor terminus array on a surface thereof facing the first conductor terminus array on said plug portion, said second conductor terminus array being in electrical circuit with circuit elements in said electronic equipment, each of said conductors in said second conductor terminus array having a raised contact of resilient electrically conductive material capable of exhibiting plastic deformation projecting from the surface proximate the end thereof, and alignment means on said planar connector assembly associated with said second conductor terminus array;

actuating means activated after said plug portion has been inserted into said receptacle recess with said conductor terminus arrays of said plug portion and said planar connector assembly in a mating relationship such that said activation moves said planar connector assembly to bring said raised contacts thereon into good electrical contact with said plug portion terminus conductor array, whereby the precise alignment of said raised contacts with said plug portion conductor terminus array is produced by said alignment means and high contact forces are produced by said actuating means such that good electrical continuity with said interconnection system is achieved.

4,540,228

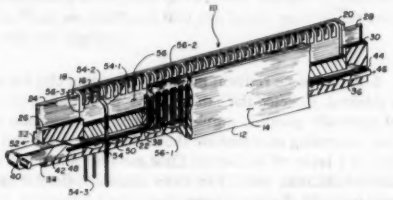
LOW INSERTION FORCE CONNECTOR WITH IMPROVED CAM ACTUATOR

Thomas S. Steele, Roseville, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,361

Int. Cl.[3] **H01R** *13/62*

U.S. Cl. 339—74 R **11 Claims**



1. A low insertion force connector for making electrical connection between a printed circuit board assembly and external electrical circuits in combination comprising:

an elongated outer housing have a centrally located opening with a channel extending longitudinally along the bottom thereof, said channel including a plurality of spaced apart ramps along the length thereof, said outer housing having first and second ends;

first and second mating ramp means each mounted on a respective one of said first and second ends of said outer-housing;

a plurality of electrically conductive contacts mounted in said outer housing on either side of said channel, said electrically conductive contacts having first end portions positioned interior said centrally located opening and bowed inwardly for contacting a printed circuit board assembly, and said plurality of electrical contacts having second end portions projecting exterior to said outer housing for making electrical contact with external electrical circuits;

an elongated cam actuator having longitudinal grooves along the side thereof and a first surface configured to mate with said spaced apart ramps along the length of said channel, said elongated cam actuator adapted to be actuated in a longitudinal direction for causing movement in a transverse direction, said elongated cam actuator having first and second ramp means mounted thereon for cooperating with said first and second mating ramp means, wherein said first and second ramp means and said first and second mating ramp means are positioned to cause transverse movement of said elongated cam actuator opposite to said transverse movement caused by said plurality of spaced apart ramps and said first surface of said elongated cam actuator;

a shell housing positioned interior said opening and including cam follower structure having gripping means cooperatively associated with said grooves in said elongated cam actuator for providing positive slideable engagement therewith and yielding transverse movement in said shall housing corresponding to said movement in a transverse direction of said elongated cam actuator, said shell housing further including a pair of upright sections forming a slot for receiving the printed circuit board assembly, each of said upright sections including contact engagement means for abutting said bowed portions of associated ones of said electrically conductive contacts and being adapted to urge said bowed portions to a position disengaged from

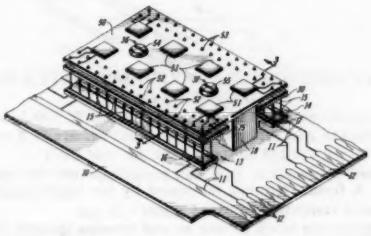
said printed circuit board assembly when said elongated cam actuator is actuated longitudinally causing said transverse movement, and said bowed portions are allowed to engage said printed circuit board assembly when said elongated cam actuator is actuated to cause the mating of said first and second ramp means with said first and second mating ramp means.

4,540,229

ELECTRICAL INTERCONNECTION APPARATUS

James J. Madden, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 12, 1982, Ser. No. 367,365
Int. Cl.³ H01R *13/54*
U.S. Cl. 339—75 M **3 Claims**



1. Electrical interconnection apparatus for removably connecting a plurality of circuit modules to a first electrical circuit board having printed wiring affixed on a surface thereof comprising

a second electrical circuit board in substantially parallel, spaced-apart relation to said first board, said second board having said plurality of modules permanently affixed thereto and having a first and a second array of plated-through apertures in electrical connection with said plurality of modules,

a first and a second array of flexible conductors electrically connected to the printed wiring of said first board, said arrays of conductors permanently attached to and extending outwardly from said first board to pass freely through said first and second array of apertures, respectively,

a first and a second insulative actuator plate laterally operable on said first and second array of conductors, respectively, for flexing said conductors of each of said arrays of conductors into electrical contact with said plated-through apertures of said first and second array of plated-through apertures, respectively, said first and second actuator plates each being spaced apart from said first board and from said second board such that said arrays of conductors are flexed but not deformed by the operation of said first and second actuator plates, each of said actuator plates having a slot formed therein in alignment with a slot in the other plate, and

cam means rotatable in said slots for laterally moving said actuator plates.

4,540,230

WEATHERPROOF HERMETICALLY SEALED CONNECTOR DEVICE

Ralph Iversen, Granada Hills, and Dewey F. Harris, Pasadena, both of Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed Dec. 27, 1983, Ser. No. 565,301
Int. Cl.³ H01K *13/62*
U.S. Cl. 339—89 M **3 Claims**

1. An improved weatherproof, hermetically sealed connector device for electrical conduits, said device comprising, in combination:

a. a male plug comprising a housing having

i. a central electrically insulative tubular component having a cavity extending therethrough adapted to receive an electrical conduit at the rear end thereof,

ii. a plurality of spaced parallel connector pins disposed in a substantially circular array and extending forwardly from the front end of said tubular component,

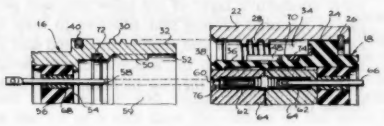
iii. a sleeve concentric with and peripheral of said pins and having an inner surface to define with said pins a peripheral space therebetween, and

iv. sealing means comprising an O-ring disposed in a recess in said sleeve inner surface and around said tubular component for hermetically sealing said tubular component against atmospheric conditions;

b. a female receptacle comprising a housing having

i. a central electrically insulative tubular member having a cavity extending therethrough adapted to receive an electrical conduit at the rear end thereof,

ii. a pin receiver on the front end of said tubular member and bearing a plurality of spaced, parallel connector pin-receiving passageways extending longitudinally of said



central tubular member and electrical connector means therein for interconnection with an electrical conduit at said rear end thereof, said passageways being aligned with said plug pins and adapted to thermal sealingly engage therewith;

iii. a sleeve concentric with and peripheral of said tubular member to define a peripheral space therebetween, said male plug sleeve being receivable within said female sleeve,

iv. locking means connected to said female sleeve to releasably secure said male plug and female receptacle together; and,

v. sealing means comprising an O-ring disposed in a recess in the outer surface of said tubular member for hermetically sealing said female receptacle against atmospheric conditions, said plug and receptacle O-rings being spaced apart longitudinally when said male plug and female receptacle are fully engaged, both O-rings engaging the opposing outer surface of said central tubular member and inner surface of said plug sleeve, whereby double hermetic sealing protection is provided.

4,540,231

CONNECTOR FOR SEMIRIGID COAXIAL CABLE

Edgar W. Forney, Jr., Harrisburg, Pa., assignor to AMP, Harrisburg, Pa.

Continuation-in-part of Ser. No. 308,760, Oct. 5, 1981,. This application Sep. 16, 1983, Ser. No. 532,870
Int. Cl.³ H01R *4/00*
U.S. Cl. 339—94 C **14 Claims**

1. An electrical connector for terminating semirigid coaxial cable, comprising:

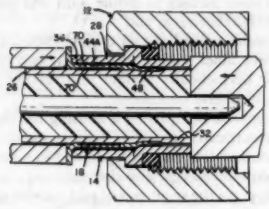
a bored tubular shell member having rearward bore means of relatively large inner diameter inwardly contoured toward forward bore means having a relatively smaller inner diameter dimensioned to receive the cable therethrough;

an adhesive is applied onto said rearward bore means and is disposed within a protective film;

coupling means on said tubular member;

bored gripping means having a rearward collar portion dimensioned to closely receive the cable therethrough,

and having a plurality of spline fingers extending forward from the periphery of said collar portion defining therebetween a profiled opening of a dimension substantially equal to the cable diameter, said gripping means being rearwardly disposed of said tubular member, whereby, upon moving said gripping means forwardly into said rearward bore means, said spline fingers are resiliently



deflected inwardly along said contour to embed into an outer conductive layer of the cable and said protective film is ruptured causing said adhesive to flow between engaging surfaces of said shell member and said gripping means whereby when the adhesive cures, the adhesive seals the connection thereby increasing the torque and tensile resistance thereof.

4,540,232

TERMINAL BOX APPARATUS

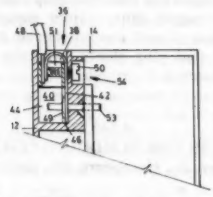
Rene A. Zibung, Bordeaux, South Africa, assignor to Swistronic (Proprietary) Limited, Transvaal, South Africa

Filed Feb. 7, 1984, Ser. No. 577,797

Claims priority, application South Africa, Feb. 18, 1983, 83/1108

Int. Cl.³ H01R *9/09, 9/24*

U.S. Cl. 339—198 G **4 Claims**



1. A terminal box apparatus including at least one terminal box having a base for supporting a PCB, the base being shaped to nest alongside the bases of other similar boxes, one or more lids for covering the PCB, a plurality of conductive straps each locatable partially in a recess formed in the base of the terminal box and partially in an aligned recess formed in the base of an adjacent similar terminal box, and a plurality of conductive pins each for securance to the PCB and each for passage through a hole in a part of the base of the terminal box into releasable, electrical engagement with one end of one of the straps to hold the PCB to the base and to establish an electrical interconnection between a terminal of the PCB and a terminal of a PCB in the adjacent terminal box via the strap.

4,540,233

FEMALE ELECTRICAL TERMINAL HAVING IMPROVED CONTACTOR BLOCK STRUCTURE

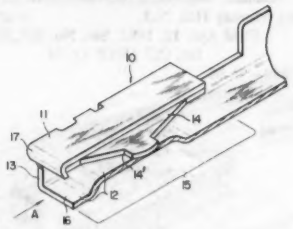
Eiji Saijo, and Shigekazu Wakata, both of Yokkaichi, Japan, assignors to Tokai Electric Wire Company Limited, Yokkaichi, Japan

Filed Aug. 29, 1984, Ser. No. 645,612

Claims priority, application Japan, Oct. 1, 1983, 58-152662[U]; Oct. 7, 1983, 58-156717[U]

Int. Cl.³ H01R *13/12*

U.S. Cl. 339—258 R **4 Claims**



1. A female terminal fabricated by bending a single sheet material comprising:

a contactor block having an end opening through which a male terminal is inserted into said contactor block so as to make contact therewith, said contactor block including an upper plate, a bottom plate, and side plates;

a resilient contact piece disposed between said upper plate and bottom plate; and

a protective guide tag formed of an extension of said upper plate which is bent, at said end opening of said contactor block, toward said bottom plate.

4,540,234

ROUND PLUG SOCKET PROVIDED WITH AN OVER-SPRING

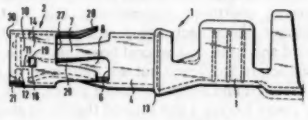
Alfred Könnemann, and Jörgen Ehrenberg, both of Wuppertal, Fed. Rep. of Germany, assignors to Grote & Hartmann GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 548,983

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241485

Int. Cl.³ H01R *13/18, 11/22*

U.S. Cl. 339—259 R **23 Claims**



1. A round plug socket comprising:

a conductor securing portion and a cylindrical spring arm base portion provided with spring arms connected to a front edge of said spring arm base portion, said spring arms extending forward away from said conductor securing portion, said spring arms being bent inward toward each other and being spaced from one another, a plug ring being provided on a front side of said spring arms;

said plug ring being embraced by a ring portion of an over-spring, said ring portion being slit in a longitudinal direction of said round plug socket; and

securing means for unreleasably seating said over-spring ring portion on said round plug socket, said securing means also limiting expansion of said over-spring to protect against any over-bending of said spring arms during

contact thereof with a male plug inserted into said round plug socket;

said securing means including tabs provided in said ring portion, said tabs being bent inward and pointing forward in an arrangement about a generetrix line of said ring portion;

said securing means also including forward edges provided in said ring portion, said forward edges being bent inward and being arranged on another generetrix line;

front edges of said tabs and said forward edges in said ring portion being arranged oppositely to each other to provide a perpendicular spacing therebetween corresponding to a width of said plug ring;

said tab front edges engaging a rear edge of said plug ring, and said ring portion forward edges engaging a front edge of said plug ring.

4,540,235

DOUBLE FLAT SPRING CONTACT PROVIDED WITH AN OVER-SPRING

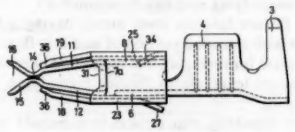
Srboslav Lolic, Wuppertal, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,117

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248078

Int. Cl.³ H01R *13/18, 11/22*

U.S. Cl. 339—259 F **11 Claims**



1. A double flat spring contact provided with an over-spring, comprising:

said double flat spring contact including connecting elements for an electrical conductor wire and a box-shaped spring arm base, said spring arm base being rectangular in cross section to provide a base bottom, opposing side walls and a pair of longitudinally divided top cover parts;

a spring arm extending forward from each cover part;

a pair of spring arms connected to a forward portion of said base bottom;

each of said cover parts being provided with a cut out having a right angle to provide a cut-out longitudinal edge and a cut-out transverse edge;

an external over-spring including a box-shaped external over-spring arm base member having a rectangular cross section;

over-spring clamp arms connected to and extending forward from said over-spring arm base member;

said external over-spring being seated about in an enclosed arrangement on said spring contact with said over-spring arm base member being mounted on said spring arm base, and said clamp arms running parallel to associated ones of said spring arms of said double flat spring contact respectively, and with said clamp arms pressing inwardly upon respective outer surfaces of said associated spring arms; and

securing means joining said over-spring arm base member to said spring arm base of said spring contact to provide an unreleasable securement of said external over-spring on said spring contact;

securing means extending into each said cut out of said cover parts of said spring arm base to provide said unreleasable securement.

4,540,236

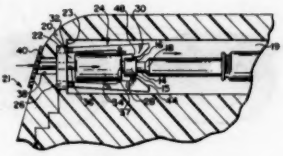
QUICK LOCK/QUICK RELEASE CONNECTOR

Charles A. Peers-Trevarton, Coral Springs, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jul. 18, 1983, Ser. No. 514,684

Int. Cl.³ H01R *13/635*

U.S. Cl. 339—45 R **17 Claims**



1. A terminal pin connector assembly for a pacer having a socket for receiving a terminal electrode assembly with a terminal pin having an annular groove therein, said connector assembly comprising a terminal pin with an annular grooves therein, quick lock/quick release connector means positioned in the socket and having means for resiliently and snap fittingly engaging in the groove in said terminal pin received in the socket for making a good mechanical and electrical connection with said terminal pin and means manually manipulatable without the aid of a tool from the outside of the pacer for actuating the engaging means to release the mechanical grip thereof on said terminal pin.

4,540,237

COUPLING ELEMENT FOR COUPLING LIGHT INTO AND OUT OF AN OPTICAL FIBER

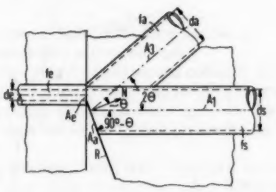
Gerhard Winzer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 396,729, Jul. 9, 1982, abandoned. This application Jan. 29, 1985, Ser. No. 695,753

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138895

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.15 **11 Claims**



1. A coupling element for coupling light into and out of a first optical fiber, said element comprising a first optical fiber with a first axis and having an end being formed by a first end surface and a second end surface inclined at an angle relative to one another, said first end surface extending essentially perpendicular to the first axis of said first optical fiber and said second end surface being inclined relative to said first axis and having a reflective layer, a second optical fiber having a second axis and being coupled to said first end surface with the second axis being parallel to the first axis and offset therefrom, and a third optical fiber branching laterally from the first optical fiber adjacent said end, the diameter of the light conducting area of the second optical fiber being smaller than the diameter of the light conducting area of each of the first optical fiber and the third optical fiber.

4,540,238

BILEVEL TELEMICROSCOPIC APPARATUS

D. Brandon Edwards, 2004 Centell Rd., Virginia Beach, Va. 23451

Filed Feb. 16, 1982, Ser. No. 348,823
Int. Cl.³ G02B *23/00*
U.S. Cl. 350—146 33 Claims

1. Spectacles comprising a carrier frame to be supported on a wearer for positioning spectacle lenses in front of the eyes of the wearer and a multiple lens optical instrument mounted to at least one of the lenses, characterized in that:

the optical instrument extends from a front lens of the instrument at about the spectacle lens toward the wearer's eye, is less than about 16 mm in overall length, and has an internal diaphragm with an aperture of about 4 mm.

4,540,239

LIGHTED MAGNIFYING LENS DEVICE

Betty S. Frankel, 2325 S. Linden St., #106N, Denver, Colo. 80222

Filed Sep. 26, 1983, Ser. No. 535,816
Int. Cl.³ G02B *27/02*
U.S. Cl. 350—235 7 Claims

1. In a magnifying device supported by a cord means slung around the user's neck, wherein the improvement comprises, in combination:

a trough shaped housing for reflecting light from a light bulb mounted within the housing to a workspace located in front of the trough opening and underneath a magnifying lens adjustably mounted in relation to the top of the housing;

slide prevention means located on the outside of the rear of the housing;

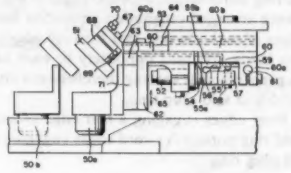
lens means in a frame which is adjustably mounted to the housing to allow for variation in the angle between the housing and the lens frame.

4,540,240

OPTICAL OBJECTIVE ADJUSTING APPARATUS

Frank G. Kadi, Santa Clara, Calif., assignor to Micronix Partners, Los Gatos, Calif.

Filed Mar. 15, 1983, Ser. No. 475,428
Int. Cl.³ G02B *7/04;* F16H *21/10*
U.S. Cl. 350—255 14 Claims



1. An optical objective device to be moved linearly, including means for moving the device to a particular location over a prescribed length of travel, said means comprising:

a fixed support relative to which linear movement of the device is desired;

means including a piezoelectric motor fixed with respect to said support for initiating an accurate incremental linear movement;

a first flexure fulcrum lever means having a first portion juxtaposed to and in contact with said piezomotor for receiving such incremental movement, said first lever means magnifying said linear movement;

a second flexure fulcrum lever means having a first end in contact with a second portion of said first flexure fulcrum lever means for receiving said magnified linear movement, said second lever means further magnifying said linear movement;

means for attaching said device to a second end of said second fulcrum lever means; and

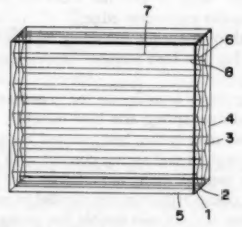
means for supporting said device linearly with respect to said fixed support.

4,540,241

CONSTRUCTION PANEL

Jean-Jacques Rivier, 467 Frontiere, Hemmingford, Canada L0L-1H0

Filed Jun. 28, 1983, Ser. No. 508,653
Claims priority, application Switzerland, Jul. 12, 1982, 824231
Int. Cl.³ G02B *17/00, 27/00*
U.S. Cl. 350—261 8 Claims



1. A panel for selectively transmitting or reflecting radiation from a source of radiation located on a front side of the panel comprising:

two pairs of rigid planar elements of transparent material having outer planar faces assembled face to face to form said panel having front and rear faces and a general plane;

each element of each pair of elements having a planar face and a face having a series of adjacent protruding prism-

shaped portions formed by facets inclined at an angle with respect to a plane extending parallel to said general plane of said panel and meeting at parallel ridges;

each pair of elements being formed by meshing engagement of said faces having said protrusions so that said facets and ridges on one element are in abutting relationship with said facets and ridges on the other element;

said pairs of elements when assembled to form a panel having said meshing ridges of one pair offset with respect to said meshing ridges of the other pair in a direction parallel to said general plane and perpendicular to the direction of said ridges;

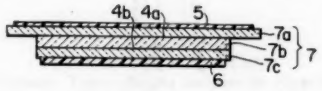
the average thickness of said elements, the width and said angle of inclinations of said facets with respect to said general plane, and said offset being predetermined so that said panel has the same transmitting or reflecting property for substantially all the radiations striking it at any given point at a given angle of incidence α with respect to a plane perpendicular to said general plane, the transmitting or reflecting property selectively depending on said angle α only, and the reflecting property being exclusively due to total reflection of said radiations on said facets.

4,540,242

LIQUID CRYSTAL DISPLAY ELEMENT

Yoshimichi Shibuya; Masami Takahashi, and Tadashi Ishibashi, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 31, 1980, Ser. No. 117,087
Claims priority, application Japan, Feb. 2, 1979, 54-10372
Int. Cl.³ G02F 1/13
U.S. Cl. 350—335 **4 Claims**



1. A reflection type liquid crystal display element comprising a first liquid crystal layer including first means for producing a digital display, and a second liquid crystal layer provided between said first liquid crystal layer and a reflecting plate and including second means for producing an analog display, said first and second means being segregated with respect to one another so that said analog and digital displays are not overlapping one another in the viewing direction from said first liquid crystal layer toward said reflecting plate.

4,540,243

METHOD AND APPARATUS FOR CONVERTING PHASE-MODULATED LIGHT TO AMPLITUDE-MODULATED LIGHT AND COMMUNICATION METHOD AND APPARATUS EMPLOYING THE SAME

James L. Fergason, 5806 Horning Rd., Kent, Ohio 44240

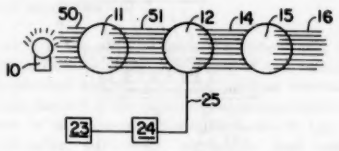
Continuation-in-part of Ser. No. 235,006, Feb. 17, 1981, Pat. No. 4,436,376, which is a continuation-in-part of Ser. No. 121,071, Feb. 13, 1980, Pat. No. 4,385,806, which is a continuation-in-part of Ser. No. 913,618, Jun. 8, 1978, abandoned. This application Aug. 19, 1982, Ser. No. 409,526
The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.
Int. Cl.³ G02F 1/13
U.S. Cl. 350—337 **20 Claims**

1. A light transmitter comprising

at least one liquid crystal cell comprising two parallel transparent plates; a transparent electrical conductive layer applied to the confronting surfaces of the said two plates; each said conductive layer having parallel surface alignment, the said alignment of the two adjoining surfaces being parallel; a continuous layer of nematic liquid crystal having positive dielectric anisotropy between the two electrical conducting coatings;

means for applying a fixed electrical bias to the two said electrical conducting coatings;

means for applying an amplitude modulated oscillatory electrical signal across the said continuous layer; a source of polarized light directed through the said two transparent plates;



whereby the light which passes through the said two transparent plates is a phase-shifted beam which is distinguishable from the light from the said source in a manner which corresponds to the said oscillatory electrical signal; and

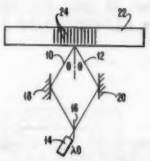
a linear polarizer for converting said phase-shifted beam to a light beam whose amplitude corresponds to said oscillatory electrical signal.

4,540,244

OPTO-OPTICAL LIGHT DEFLECTOR/MODULATOR

Glenn T. Sincerbox, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 28, 1982, Ser. No. 383,044
Int. Cl.³ G02B 5/172, 5/18
U.S. Cl. 350—354 **9 Claims**



1. An opto-optical light deflector comprising:

a transparent optical active medium,

means for providing first and second coherent wavefronts of wavelength (λ_0) to travel in said medium thereby producing an optically generated standing wave that induces a periodic variation in the optical properties for diffraction purposes,

means for providing a third wave front (λ_1) to travel in said medium, said third wavefront being diffracted by the periodic variation, and

means for varying the wavelength of said first wavefront and said second wavefront to the same wavelength (λ_m) to alter the periodicity of the variation whereby the diffraction direction of said third wavefront is altered.

4,540,245

APPARATUS AND METHOD FOR ACOUSTO-OPTIC CHARACTER GENERATION

Leon Bademian, Vienna, Va., assignor to Isomet Corporation, Springfield, Va.

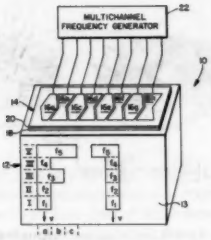
Filed Nov. 10, 1983, Ser. No. 550,590
Int. Cl.³ G02F 1/33; H04N 5/74
U.S. Cl. 350—358 **20 Claims**

1. An acousto-optic character generator system, comprising:

(a) multi-channel frequency generator means,

(b) a body of acousto-optic material,

(c) means conneted to said frequency generator means for sequentially producing within said body, in one or more of a set of acoustic energy columns, a plurality of traveling acoustic energy column segments each having a different predetermined acoustic frequency and representing an associated portion of a character to be generated,



(d) means for flashing a discrete pulse of light through said body containing said acoustic energy column segments to create a plurality of pulsed diffracted light beams, and

(e) means for directing said pulsed diffracted light beams to a corresponding plurality of fixed locations in a character reproduction plane to create in said plane optical representations of the portions of the character to be generated.

4,540,246

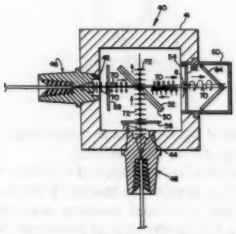
HOLOGRAPHIC OPTICAL APPARATUS FOR USE WITH EXPANDED-BEAM TYPE FIBER OPTICAL COMPONENTS

Stephen D. Fantone, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 28, 1983, Ser. No. 479,488

Int. Cl.[3] G02B *5/14, 5/32*

U.S. Cl. 350—3.70 **7 Claims**



1. Apparatus for optically coupling optical fibers, said apparatus comprising:

a plurality of optical components each of which includes a refracting surface having a focus at a predetermined location behind said refracting surface and which is adapted to facilitate receiving and positioning an end of an optical fiber at or nearly at said focus, said refracting surface being optically configured so that light emerging from an optical fiber located at a focus thereof is collimated and aimed by said refracting surface within predetermined angular tolerances on emerging therefrom and so that collimated light within the numerical aperture of said optical components which strikes said refracting surface thereof is nominally focused thereby into the end of an optical fiber;

a housing adapted to receive and support said optical components such that at least one of said optical components is nominally aimed in a first direction and the others of said optical components are nominally aimed in a direction different from that of said first direction; and

reflection holographic means of predetermined size positioned within said housing and exposed and developed in place in said housing to operate to intercept an output from said optical component aimed in said first direction and precisely direct it into predetermined ones of said differently aimed other optical components and to precisely direct the output from any of said differently aimed optical components into the end of said optical component aimed in said first direction, said reflection holographic means having interferometrically formed therein index of refraction variations by exposure and development in place to correct for any aiming errors between said components.

4,540,247

HOLOGRAM SCANNER

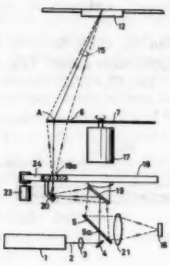
Kazuro Nishi; Koichiro Kurahashi; Tsutomu Hashimoto; Toshihiko Senoo, and Shinji Yamato, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 21, 1982, Ser. No. 390,569

Claims priority, application Japan, Jun. 26, 1981, 56-100160

Int. Cl.[3] G42B *5/32*

U.S. Cl. 350—3.71 **10 Claims**



1. A hologram scanner, comprising;

a hologram disk including a plurality of hologram lenses arranged circumferentially thereon;

means for rotating said hologram disk;

rotating light beam guide means for successively shifting irradiation regions in a direction with respect to the direction of rotation of said hologram disk, to successively apply a light beam to said hologram lenses on said hologram disk, said rotating light beam guide means having a rotational speed different from the rotational speed of said hologram disk and a rotational direction opposite to that of said light beam guide means; and

a reading window for reading an object to which said light beam is applied through said hologram lens;

wherein a radial raster pattern having parallel scan lines is defined having a number of scan lines equal to the number of hologram lenses.

4,540,248

OBJECTIVE LENS SYSTEM FOR MICROSCOPES

Takayoshi Togino, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,148

Claims priority, application Japan, Mar. 24, 1983, 58-47916

Int. Cl.[3] G02B *21/02*

U.S. Cl. 350—414 **6 Claims**

1. An objective lens system for microscopes comprising a first positive lens component, a second positive cemented doublet, a third lens unit comprising at least one cemented lens, a fourth meniscus cemented doublet component having a convex surface on the object side and a fifth negative cemented

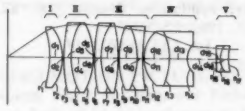
doublet component, said lens system being so designed as to satisfy the following conditions (1) through (4):

$$1.65 < n_{I-1} \quad (1)$$

$$-4.0f < r_{I-2}/(n_{I-1}-1) < -2.0f \quad (2)$$

$$d_{I-1} < 1.5f \quad (3)$$

$$1.8f < r_{IV-3}/(n_{IV-2}-1) < 2.2f \quad (4)$$



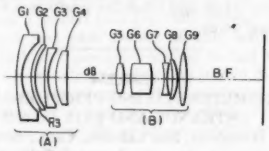
wherein the reference symbols represents focal length of said objective lens system as a whole, the reference symbol n_{i-j} designates refractive index of the j th lens element of the i th lens component, the reference symbol r_{i-j} denotes radius of curvature on the j th surface of the i th lens component and the reference symbol d_{i-j} represents airspace reserved between the j th and j+1 th surfaces of the i th lens component.

4,540,249

WIDE ANGLE ZOOM LENS

Satoshi Mogami, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 24, 1982, Ser. No. 391,828
Claims priority, application Japan, Jul. 3, 1981, 56-103245
Int. Cl.³ G02B *13/18, 15/14*
U.S. Cl. 350—426 **18 Claims**



1. A wide angle zoom lens having an angle of view of 90 degrees or greater at the wide angle end and a zoom ratio of 1.6 or greater and consisting of two lens groups which are, in succession from the object side, a divergent lens group and a convergent lens group, and in which magnification change is effected by relative movement of said two lens groups,

said divergent lens group comprising at least two negative lenses and a positive lens disposed most adjacent to the image side, one of said negative lenses being formed of a low-index high-dispersion material having a refractive index of 1.5 or less and an Abbe number of 62 or less, said negtive lens formed of the low-index high-dispersion material having a non-spherical surface in which the difference in thickness between the central portion and the marginal edge portion is small, said wide angle zoom lens being characterized in that when said non-spherical surface is approximated by

$$x = \frac{C_0 y^2}{1 + \sqrt{1 - C_0^2 y^2}} + C_4 y^4 + C_6 y^6 + C_8 y^8 + C_{10} y^{10},$$

said zoom lens satisfies the following conditions for coefficients C_8 an C_{10}:

$$0 < |C_8| < 0.025 fw \times 10^{-7}$$

$$0 < |C_{10}| < 0.05 fw \times 10^{-9},$$

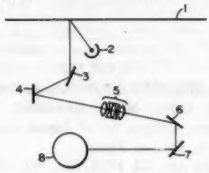
where y is the distance from the optical axis, x is the distance from the tangential plane of the vertex of the non-spherical surface, C_0 is the paraxial curvature (the inverse number of the radius of paraxial curvature) at the vertex of the non-spherical surface, C_4 to C_{10} are the fourth-order, sixth-order, eigth-order and tenth-order non-spherical surface coefficients, and fw is the focal length of the lens system at the wide angle end thereof.

4,540,250

IMAGE DETECTING DEVICE

Susumu Seto, Odawara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 275,405, Jun. 18, 1981, abandoned.
This application May 29, 1984, Ser. No. 614,843
Claims priority, application Japan, Jul. 1, 1980, 55-89639
Int. Cl.³ C03C *3/24;* G02B *27/00*
U.S. Cl. 350—438 **18 Claims**



1. An image detecting device comprising:

an illuminating system having an illuminating light source for illuminating a preselected area of an object;

a photoreceptor for receiving an image of said preselected area of an object; and

an imaging lens system disposed in the path of the image to be received by the photoreceptor, said system including at least one imaging lens made of an optical glass havng a wavelength selectivity to certain visible light wavelengths to which said photoreceptor is sensitive, wherein such selectivity results from an absorption of a predetermined portion of visible light wavelengths by said one imaging lens to compensate for the wavelength sensitivity of said photoreceptor and the spectral wavelength characteristics of said illuminating system, wherein said selectivity provides a detected image on the photoreceptor having a uniform density over the overall wavelength range.

4,540,251

THERMO-MECHANICAL OVERLAY SIGNATURE TUNING FOR PERKIN-ELMER MASK ALIGNER

David W. T. Yau, Hopewell Junction, and Robert A. Modavis, Painted Post, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 1, 1983, Ser. No. 557,018
Int. Cl.³ G02B *5/10*
U.S. Cl. 350—611 **6 Claims**

1. In an optical mask aligning apparatus used in the manufac-

turing of semiconductor devices by photolithography, said apparatus including:

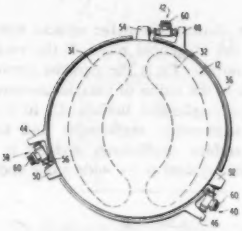
a first stage for receiving the semiconductor wafer;

a second stage for receiving a mask;

alignment means for aligning the mask and wafer relative to each other;

an illuminator for illuminating the mask to form an image thereof;

an image transferring means for transferring the mask image to the wafer;



said image transferring means including a primary mirror suspended by a system of flexures;

the improvement comprising:

a reversible heat pump in thermal conductivity relationship to at least one of said flexures for adjusting the temperature of the flexure to establish stresses in the primary mirror suspension which are transferred to the primary mirror so as to compensate distortion in the image transfer means.

4,540,252

SIDE-MIRROR DRIVING APPARATUS

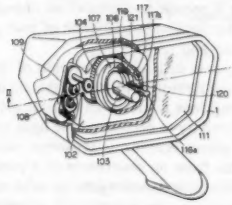
Mikio Hayashi, Oubu; Kouzi Kawasumi, Nagoya, and Yoshinobu Kimura, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 23, 1984, Ser. No. 602,746

Claims priority, application Japan, Feb. 2, 1984, 59-18956

Int. Cl.³ G02B *5/08*

U.S. Cl. 350—634 **6 Claims**



1. A side-mirror driving apparatus comprising:

a mirror driving housing;

a supporting shaft fixed to said housing;

a mirror swingably supported at a forward end of said supporting shaft; and

a driving means for inclining said mirror, wherein the driving means comprises:

at least one gear rotatably supported by said housing;

an electric motor for rotating said gear;

at least one lift lever, one end of which is swingably linked to the rear surface of said mirror and the other end of which is operatively connected to the front surface of said gear; and

a set position stopping device arranged at a side of the rear surface of said gear for stopping said gear at a desired position.

4,540,253

METHOD AND DEVICE FOR MEASURING EYE REFRACTION ERRORS

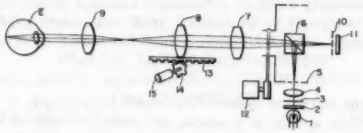
Shuji Hoshika, Saitama; Hideyuki Ishiai, Tokyo; Yukiyasu Nishikawa, Saitama; Masato Hara, Tokyo; Hirochika Aiura; Ikuzo Okamoto, both of Saitama, and Osamu Shindow, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 262,663, May 11, 1981, abandoned. This application Jul. 30, 1984, Ser. No. 635,472

Claims priority, application Japan, May 12, 1980, 55-64756[U]; May 27, 1980, 55-70338

Int. Cl.³ A61B *3/14*

U.S. Cl. 351—211 **12 Claims**



1. An eye refraction error measuring apparatus comprising a light source; means for directing light from said light source and a plurality of patterns onto an eye to be measured; at least one light receiving element receiving light refracted from the retina of said eye; an automatic gain control circuit for determining a gain factor of an output signal from said light receiving element; analog-to-digital converter means for converting an output of said automatic gain control circuit to digital data; a microprocessor receiving digital data from said analog-to-digital converter means for performing nonlinear regression upon outputted data from said analog-to-digital converter, for determining eye refraction errors in accordance with results of said nonlinear regression, for determining a reliability coefficient, and for determining when said reliability coefficient is less than a predetermined value; and visual displaying means, said microprocessor operating said displaying means to display said eye refraction errors when said reliability coefficient is greater than said predetermined value and for producing an indication to an operator when said reliability coefficient is less than said predetermined value.

4,540,254

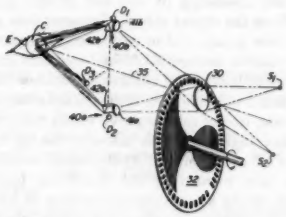
KERATOMETER HAVING PERIPHERAL LIGHT ENTRANCE AND EXIT PATHS

William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed Oct. 26, 1982, Ser. No. 436,871

Int. Cl.³ A61B *3/10, 3/14*

U.S. Cl. 351—212 **4 Claims**



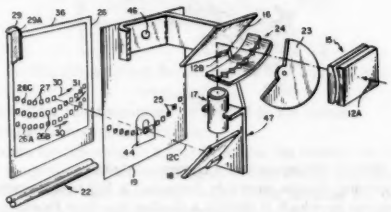
1. A keratometer for testing with light about an optical axis the cornea of a human eye and yielding eye positional informa-

tion relative to the keratometer and topographical information relating to the eye in sphere, cylinder and axis, said keratometer comprising: an array of a plurality of light sources located about said optical axis and spaced apart from said eye for reflection of light onto said eye; an array of a plurality of light receiving paths located about said optical axis and spaced apart from said eye for receiving light reflected from said eye, the light from one of said sources to said light receiving path being spaced apart and removed from the optical axis of said keratometer, each of said arrays being disposed substantially normal to the optical axis and one of said arrays being two dimensional; a light detector communicated to one of said light receiving paths for determining changes in the configuration of three dimensional array to determine eye spacing and topography of said eye in sphere, cylinder and axis.

4,540,255
CARD MOTION PICTURE METHOD

Philip R. Norris, North Reading, and Richard R. Wareham, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 047,024, Jun. 11, 1979, Pat. No. 4,253,748. This application Apr. 14, 1980, Ser. No. 139,868
Int. Cl.³ G03B *19/18*
U.S. Cl. 352—44 **3 Claims**



1. A method of producing motion pictures comprising the steps of:

supporting a sheet of photographic film in a given film plane;

intermittently directing scene light from a photographic scene to spaced areas of said film plane to produce images thereat, said directing step including directing scene light along a first path generally parallel to said film plane and then along a second path generally normal thereto;

pivoting said first path around an axis spaced from said second path and generally normal to said film plane to produce an arcuate row of images in said film sheet;

advancing said film sheet, at the completion of each said arcuate row, in a direction substantially normal to said arcuate path to provide an unexposed film portion in said spaced areas; and

repeating said directing and advancing steps to record a plurality of image rows in said film sheet.

4,540,256
MOTION PICTURE FILM CARD

Philip R. Norris, North Reading, and Richard R. Wareham, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

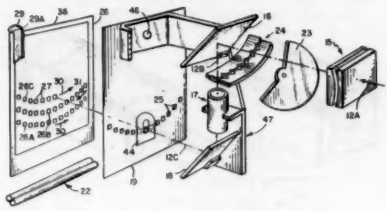
Division of Ser. No. 47,024, Jun. 11, 1979, Pat. No. 4,253,748. This application Apr. 14, 1980, Ser. No. 139,867
Int. Cl.³ G03C *1/76*
U.S. Cl. 352—239 **3 Claims**

1. A motion picture film unit having a plurality of sequentially recorded images in arcuate rows formed by the method comprising the steps of:

supporting said film unit in a given film plane;

intermittently directing scene light from a photographic scene to spaced areas of said film plane to produce images thereat, said directing step including directing scene light along a first path generally parallel to said film plane and then along a second path generally normal thereto;

pivoting said first path around an axis spaced from said second path and generally normal to said film plane to produce an arcuate row of images in said film unit;



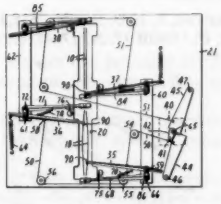
advancing said film unit, at the completion of each said arcuate row, in a direction substantially normal to said arcuate path to provide an unexposed film portion in said spaced areas; and

repeating said directing and advancing steps to record a plurality of image rows in said film unit.

4,540,257
CARD SEPARATING MEMBERS FOR A MICROFICHE STORAGE AND RETRIEVAL SYSTEM

John E. Burbank, III, Ridgefield, Conn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 474,570, Mar. 11, 1983, Pat. No. 4,487,487. This application Mar. 19, 1984, Ser. No. 591,053
Int. Cl.³ G03B *23/08*
U.S. Cl. 353—103 **12 Claims**



1. In a microfiche card storage and retrieval device having a tray for storing a plurality of microfiche cards with edges of the cards disposed in generally parallel alignment in selective slots formed in opposed flanges defining said tray, the improvement comprising

a pair of fingers disposed adjacent the flanges,

means for moving said fingers from a rest position adjacent an edge of a said slot near said flanges toward a position generally centrally of the flanges of said tray, said means for moving said fingers comprising means for moving said fingers on a path from said rest position toward said center position and spaced from each other and from the edge of said slot, and means for returning said fingers to said rest position such that when said fingers are in said position adjacent the center of the tray the cards adjacent a preselected one of said slots in said tray will have the centers bowed away from the preselected slot for supporting a selected card.

4,540,258

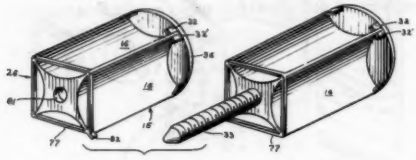
APPARATUS FOR PHOTOGRAPHING BODY CAVITIES

Rudolph J. Chiodo, West Hempstead, N.Y., assignor to Dimedco, New Rochelle, N.Y.

Filed Jan. 25, 1983, Ser. No. 460,832

Int. Cl.³ G03B *15/00, 29/00*

U.S. Cl. 354—62 **4 Claims**



1. In an apparatus for photographing cavities of the body having a pair of tubular cameras, each containing a film-holding spider; a lighting element intermediate said cameras having a filament producing a glow discharge upon application of current; a tubular shutter slidably enclosing said cameras; means to move said cameras axially of said tubular shutter to permit exposure of said film in said spiders; and means to supply air to said apparatus and to expel air into a body cavity, the improvement comprising means for retaining said film in each of said spiders comprising:

an end cap for one end of said spider;

a pair of oppositely spaced anchor tabs extending partially axially of said spider from said end cap for holding one end of a film strip in said spider; and

a restraining bar spaced across the face of said spider at the other end of said spider for holding the other end of the film strip in said spider.

4,540,259

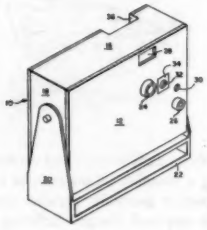
IDENTIFICATION CARD CAMERA SYSTEM AND METHOD

Linda L. Blakely, Belmont, and Myron A. Seiden, Needham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1983, Ser. No. 538,374

Int. Cl.³ G03B *17/24, 17/48, 41/00*

U.S. Cl. 354—109 **23 Claims**



1. The method of providing a composite identification card having an image of both a subject and data related thereto presented in adjoining relation in a given card format and also providing a record of the subject image and related data, said method comprising:

providing a data carrier for presenting card data relating to a given subject and other data relating thereto in adjoining relation in a given plane and in a format similar to said given card format, but with said other data being presented by said carrier in the area of the carrier format which corresponds to the subject area in said card format;

forming an image of said given subject in photo card material in a given subject area thereof and in photo record material in a first area thereof; and

forming an image of only said card data of the carrier presentation in a data area of said card material adjoining said subject area and a full image of said carrier presentation in a second area of said record material whereby said record material includes an image of said subject and an image of both card data and said other data.

4,540,260

SHUTTER MECHANISM OF A CAMERA

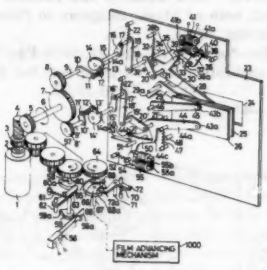
Yoshiyuki Nakano, Tokyo, Japan, assignor to Nippon Kogaku K.K., Japan

Filed Oct. 11, 1983, Ser. No. 540,838

Claims priority, application Japan, Oct. 16, 1982, 57-156439[U]

Int. Cl.³ G03B *9/40*

U.S. Cl. 354—173.1 **9 Claims**



1. A shutter mechanism of a camera including:

(1) opening means movable between a light-intercepting position in which it shields a shutter aperture from light and a non-light-intercepting position in which it does not shield the shutter aperture from light;

(2) closing means movable between a light-intercepting position in which it shields the shutter aperture from light and a non-light-intercepting position in which it does not shield the shutter aperture from light;

(3) first spring means for biasing said opening means so that said opening means is moved from said light-intercepting position to said non-light-intercepting position;

(4) second spring means for biasing said closing means so that said closing means is moved from said non-light-intercepting position to said light-intercepting position;

(5) electrical driving means;

(6) first charge means receiving the drive force of said driving means for moving said opening means from said non-light-intercepting position to said light-intercepting position or the vicinity thereof and charging said first spring means immediately after said closing means has reached said light-intercepting position from said non-light-intercepting position;

(7) second charge means receiving the drive force of said driving means for moving said closing means from said light-intercepting position to said non-light-intercepting position and charging said second spring means, in response to a shutter release operation;

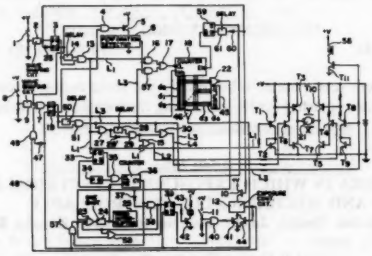
(8) means for permitting said first spring means to drive said opening means from said light-intercepting position to said non-light-intercepting position after the movement of said closing means to said non-light-intercepting position by said second charge means, thereby starting exposure; and

(9) means for permitting said second spring means to drive said closing means from said non-light-intercepting position to said light-intercepting position in a predetermined time after the starting said exposure, thereby terminating the exposure.

4,540,261
FILM TRANSPORTING DEVICE FOR USE IN A CAMERA

Toshiaki Matsumoto, Izumisano, and Nobuyuki Taniguchi, Tondabayashi, both of Japan, assignors to Minolta Camera, Osaka, Japan

Continuation of Ser. No. 435,217, Oct. 19, 1982, Pat. No. 4,477,163. This application Jul. 17, 1984, Ser. No. 631,155
Claims priority, application Japan, Oct. 20, 1981, 56-168242
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.³ G03B *1/18, 17/36*
U.S. Cl. 354—173.11 **4 Claims**



1. A film transporting device for use in a camera, comprising:

means for winding-up a film loaded in the camera;

means for rewinding the film;

means for counting, in a first direction, the number of frames wound-up by said winding-up means during the wind-up operation, said counting means being adopted for counting, in a second direction opposite to said first direction, the number of frames rewound by said rewinding means during said rewinding operation;

means for enabling the count operation of said counting means upon closure of a back lid of the camera;

means for resetting the number counted by said counting means into a predetermined initial condition upon opening of the back lid of the camera; and

means for detecting when said counting means has counted, in said second direction, a predetermined number of frames from said predetermined initial condition.

4,540,262
CAMERA ACCESSORY WITH DATA PRODUCER

Masaaki Nakai, Nara; Masayoshi Sahara, Sennan, and Nobuyuki Taniguchi, Tondabayashi, all of Japan, assignors to Minolta Camera, Osaka, Japan

Filed Mar. 4, 1983, Ser. No. 472,133
Claims priority, application Japan, Mar. 5, 1982, 57-35659; Mar. 17, 1982, 57-37741[U]
Int. Cl.³ G03B *17/18, 17/56*
U.S. Cl. 354—195.13 **20 Claims**

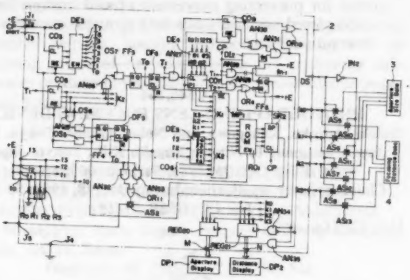
1. A camera accessory capable of transmitting data to a camera comprising:

a read only memory for storing various data at a plurality of addresses, respectively, the data including a group related to said camera accessory and other groups unrelated to said camera accessory, but related to other camera accessories;

means for providing a code signal identifying said camera accessory;

means for receiving a digital signal from said camera; and

means responsive to said code signal and said digital signal for controlling a data transmission from said camera accessory to said camera so that only the data of said group related to said camera accessory are transmitted to said camera,

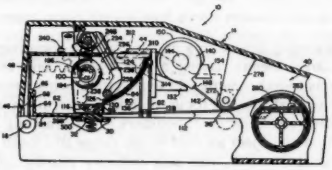


whereby said read only memory serves as a general element common to said camera accessory and said other camera accessories.

4,540,263
FILM PROCESSOR HAVING A LOADING DOOR INTERLOCK

G. Richard Kramer, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 11, 1984, Ser. No. 619,602
Int. Cl.³ G03D *5/02, 5/06*
U.S. Cl. 354—304 **10 Claims**



1. A manually operable film processor for processing individual rolls of photographically exposed film, said film processor comprising:

a housing for defining a lighttight chamber, said housing including a loading door movable between open and closed positions;

means for locating a film processing kit within said housing, the kit including a strip of flexible sheet material, a rupturable container having therein a supply of processing liquid, and a processing liquid dispenser which is adapted to apply a coating of processing liquid to one side of the sheet material as it is being withdrawn from the kit;

means for supporting a film cassette containing therein a roll of exposed film;

means mounted within said housing for receiving leading ends of the exposed film and the flexible sheet material, said receiving means being adapted to be driven in a direction so as to withdraw the film and sheet material from the cassette and the kit, respectively, and wind them in superposition upon said receiving means;

rupturing means mounted for movement into the kit and into rupturable engagement with the container of processing liquid to thereby enable the processing liquid to flow to the dispenser and thence onto the sheet material prior to it being superposed with the film;

means movable from a first position to a second position for opening the kit;

manually operable means drivingly coupled to said movable means and to said rupturing means for driving said opera-

ble means into said second position thereby opening the kit and for subsequently driving said rupturing means into engagement with the container of processing liquid; and

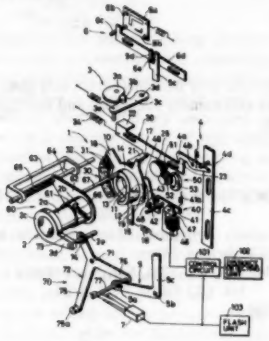
means for preventing movement of said loading door into said closed position when said movable means is in said second position.

4,540,264

PHOTOGRAPHING LENS FOCUSING DEVICE

Koichi Daitoku, Kanagawa, and Nobuo Okabe, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 665,398
Claims priority, application Japan, Oct. 28, 1983, 58-202330
Int. Cl.³ G03B *13/18*
U.S. Cl. 354—400 **5 Claims**



1. A focusing device in a camera, which comprises:

lens barrel means having a lens system, said lens barrel means together with said lens system being moved along the optical axis to focus said lens system on an object located in the range of ordinary photographing distances and on an object located in the range of closest focusing distances shorter than said ordinary photographing distances;

detecting means for detecting a distance to an object, to provide an output signal according to said distance thus detected;

main drive means for moving said lens barrel means in response to said output signal provided by said detecting means, to focus said lens system on said object located in the range of ordinary photographing distances; and

auxiliary drive means with a member operated by the operator, said auxiliary drive means moving said lens barrel means independently of said main drive means, to focus said lens system on said object located in the range of closest focusing distances.

4,540,265

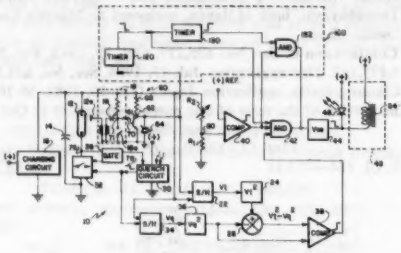
ENERGY-SAVING ELECTRONIC FLASH APPARATUS

Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 460,422, Jan. 24, 1983, abandoned. This application Jul. 2, 1984, Ser. No. 627,179
Int. Cl.³ G03B *15/03, 15/05*
U.S. Cl. 354—417 **7 Claims**

1. In electronic flash apparatus having energy-saving quench means actuatable for terminating the discharging of energy from an energy-storage capacitor to quench said flash apparatus, the improvement comprising:

energy-monitoring means, arranged for the measuring of energy resulting from the discharging of said capacitor for a flash-firing operation, for measuring the energy discharged relative to the energy retained by said capacitor at the termination of such flash-firing operation, to determine whether or not said capacitor retains adequate energy to produce an acceptable flash exposure of a subsequent scene under substantially the same exposure conditions as existed for the preceding flash exposure operation.

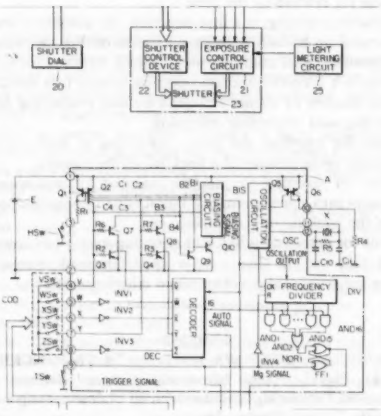


4,540,266

CAMERA IN WHICH EXPOSURE IS ELECTRICALLY AND MECHANICALLY CONTROLLABLE

Yuji Okubo, Omiya, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,375
Claims priority, application Japan, Feb. 19, 1983, 58-25496
Int. Cl.³ G03B *7/08*
U.S. Cl. 354—458 **10 Claims**



1. A camera controlling exposure, said camera comprising:

(a) first control means for electrically controlling the time of said exposure;

(b) power supply means for supplying power to said first control means, said first control means being capable of controlling the time of said exposure when said power supply means supplies power to said first control means;

(c) second control means for mechanically controlling the time of said exposure;

(d) an operating member for selecting one of said first and second control means, said operating member being operable to set the time of said exposure;

(e) means for producing a binary code in response to said operating member, said binary code including information indicative of one of said first and second control means selected by said said operating member and information

indicative of the time of said exposure set by said operating member; and

(f) inhibition means for inhibiting said power supply means from supplying power to said first control means in response to said binary code indicative of said second control means selected by said operating member.

4,540,267

ROLL-FUSING APPARATUS

Hermann Moser, Darmstadt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,485

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 3323068

Int. Cl.³ G03G *15/00*; B30B *3/04*

U.S. Cl. 355—3 FU **18 Claims**

1. A roll-fusing apparatus, comprising:

an internally heated fusing roller; and

a pressure roller positioned adjacent to said fusing roller for fusing a toner image on a copy support which is conveyed between said rollers, said pressure roller comprising a coated hollow roller core supported on a shaft, wherein the roller core comprises a substantially cylindrical inner surface and a radially symmetrical outer surface comprising alternating regions of greater and lesser circumference.

4,540,268

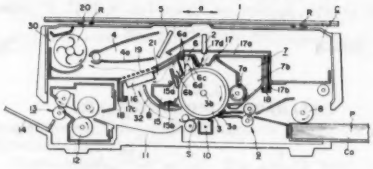
PROCESS KIT AND IMAGE FORMING APPARATUS USING SUCH KIT

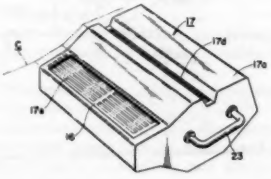
Tsutomu Toyono, and Shigeyoshi Onoda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 488,177

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—3 R **32 Claims**





1. A process kit mountable to an image forming apparatus comprises:

an image bearing member;

discharging means provided along said image bearing member for charging said image bearing member;

a housing covering said image bearing member and said discharging means; and

an air flow passage provided between said image bearing member and said housing and communicating with an opening provided on said housing for exhausting substances produced by said discharging means into the apparatus body.

4,540,269

OPENING DETECTING DEVICE OF A COPY DOCUMENT COVER SUITABLE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

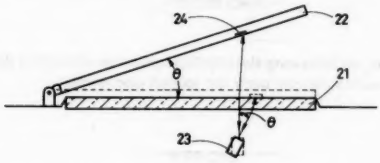
Haruo Nishiyama, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 26, 1983, Ser. No. 545,543

Claims priority, application Japan, Oct. 28, 1982, 57-164245[U]

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **13 Claims**



1. A detecting device for detecting the opening and closing of a document cover means, said cover means being pivotable about an axis at one end thereof with respect to a document table means for an electrophotographic copying machine comprising:

sensor means for sensing the opening and the closing of the document cover means said sensor means including a light emitting element and a light receiving element;

a single light reflective means disposed on the underside of the document cover means for reflecting light from the light emitting element back toward the light receiving element; and

detection means responsive to the output of the light receiving element for detecting whether the document cover means is disposed within a predetermined angular range about said axis and with respect to said document table means.

4,540,270

ELECTROPHOTOGRAPHIC COPYING MACHINE WITH A PRE-COPY SYSTEM

Yoshiaki Imanaka, Nara, and Hiroshi Kinashi, Uji, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 2, 1984, Ser. No. 576,272

Claims priority, application Japan, Feb. 9, 1983, 58-21212

Int. Cl.³ G03G *15/00, 21/00*

U.S. Cl. 355—3 R **1 Claim**

1. An electrophotographic copying machine comprising:

initialization means for preparing a photoreceptor for receiving a latent image thereon;

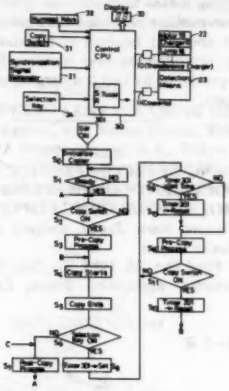
copying means responsive to the operation of the initialization means for copying a document;

selection means for selecting whether a second document is to be copied following a first document;

timer means responsive to said selection means for counting a time of initializing said photoreceptor by said initialization means; and

a copy start switch means operated for starting to copy the second document, said copy start switch means to be operated during the full time counted by said timer means

whereby said initialization means is responsive to the operation of the selection means for preparing the photoreceptor just following the copying operation of the first document to thereby copy the second document.



4,540,271

ELECTROPHOTOGRAPHIC APPARATUS HAVING IMPROVED, FIXED-CONTACT GROUNDING STRUCTURE

David M. Rakov, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1983, Ser. No. 509,081
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **5 Claims**

1. In electrophotographic apparatus of the type having an operative electrographic path and constructed to mount and move a photoconductor image sheet, which includes a photoconductive insulator layer overlying a conductive layer on an insulative support, along such path, a device for coupling such conductive layer to a source of reference potential, said device comprising:

(a) an engaging member having a support portion;

(b) a plurality of sharp, electrically conductive probe elements consisting of vitreous carbon particles which are structurally coupled to said support portion and electrically coupled to a source of reference potentiøl;

(c) means for mounting said engaging member for movements such that: (1) said probe elements are movable into and out of a low resistance, ohmic contact with the conductive layer of such an image sheet and (2) said engaging member and said probe elements are movable along the operative path of said apparatus with a contacted image sheet; and

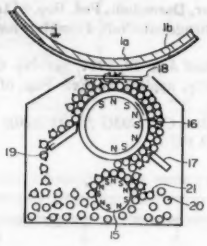
(d) means for urging said engaging member in a direction such that said probe elements will penetrate into electrical contact with such conductive layer.

4,540,272

MULTICOLOR PRINTING DEVICE

Fumitaka Abe, Kawasaki; Masatoshi Kimura, Yokohama; Toshihiko Watanabe, Atsugi, and Hiroshi Yamada, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 23, 1983, Ser. No. 477,950
Claims priority, application Japan, Mar. 25, 1982, 57-46390
Int. Cl.³ G03G *15/01*
U.S. Cl. 355—4 **7 Claims**



1. A multicolor printing device comprising

a latent image formation means, which selectively forms an electrostatic latent image on a latent image formation medium, wherein said latent image includes respective portions corresponding to a plurality of colors to be developed,

a plurality of developing means for respectively developing said corresponding colors after the formation of said latent image, and

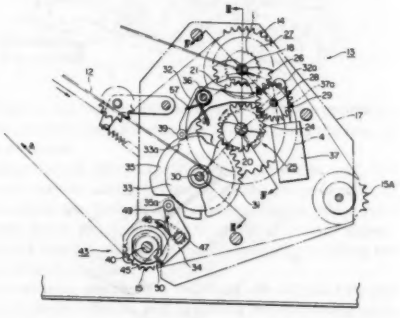
means for defining respective developable regions of each developing means in correspondence to said respective portions of said latent image for said corresponding colors to be developed, said means for defining being located between said latent image formation means and said developing means.

4,540,273

APPARATUS FOR DRIVING OPTICAL SYSTEM FOR EXPOSURE OF A COPYING MACHINE

Takashi Tamura, Higashimine, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1983, Ser. No. 464,903
Claims priority, application Japan, Feb. 9, 1982, 57-19044
Int. Cl.³ G03B *27/50*
U.S. Cl. 355—8 **9 Claims**



1. In a photocopying machine having an optical system for optically scanning a document to be copied, and a driving force transmitting means for driving said optical system in forward and backward directions for the purpose of scanning

of the document to be copied, said driving force transmitting means comprising:

a driving motor;

a rotatable driving force transmitting member coupled to said optical system for driving said optical system in said forward and backward directions;

a first driving system coupled between said motor and said driving force transmitting member for transmitting forward rotational movement to said driving force transmitting member;

a second driving system coupled between said motor and said driving force transmitting member for transmitting reverse rotational movement to said driving force transmitting member;

said first driving system including a first spring clutch for transmitting forward rotational movement to said driving force transmitting member in response to engagement of said first spring clutch;

said second driving system including a second spring clutch for transmitting reverse rotational movement to said driving force transmitting member in response to engagement of said second spring clutch;

an actuating lever having a first engaging member, said actuating lever being selectively movable to a first position at which said first engaging member engages said first spring clutch to cause said first spring clutch to engage to thereby rotate said driving force transmitting member in said forward direction;

spring means coupled to said actuating lever for biasing said actuating lever toward said first position to urge said engaging member toward said first clutch engaging position;

a cam member coupled to said driving force transmitting member and rotatable in correspondence with said driving force transmitting member, said cam member including a cam means for moving said actuating lever from said first position thereof where said actuating lever causes said first spring clutch to engage to cause said driving force transmitting member to rotate in said forward direction, to a second position thereof where said engaging member of said actuating lever releases engagement of said first spring clutch, thereby causing said driving force transmitting member to stop rotating and to stop movement of said optical system and

actuating means coupled to said actuating lever for causing said first engaging member of said actuating lever to engage with said second spring clutch of said second driving system to cause said second driving system to transmit reverse rotational movement to said driving force transmitting member to thereby move said optical system in said backward direction toward its original position.

4,540,274

IMAGE FORMING APPARATUS

Yasuo Abuyama, Ebina, Japan, assignor to Toshiba Corporation, Kawasaki, Japan

Continuation of Ser. No. 457,279, Jan. 11, 1983,. This application Feb. 28, 1984, Ser. No. 583,485

Claims priority, application Japan, Jan. 18, 1982, 57-5795

Int. Cl.³ G03G *15/20*

U.S. Cl. 355—14 FU **6 Claims**

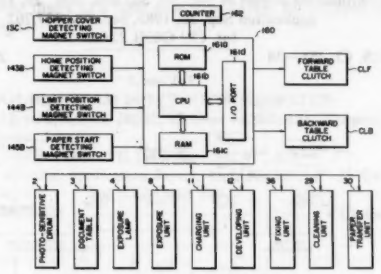
1. An image forming apparatus, comprising:

image forming means for forming a visible image on a paper sheet;

conveyor means for conveying the paper sheet to said image forming means;

fixing means for fixing the visible image formed on the paper sheet by said image forming means; and

control means for controlling said fixing means and said conveyor means, said control means including means for driving said conveyor means for a predetermined time, means for driving said fixing means until the temperature of said fixing means reaches a predetermined temperature, and means for detecting that the temperature of said fixing means reaches said predetermined temperature and stopping said conveyor means when the temperature of said



fixing means is detected to be said predetermined temperature.

4,540,275

CONTROLLING METHOD FOR TRANSFERRING AND SEPARATION IN A COPYING APPARATUS

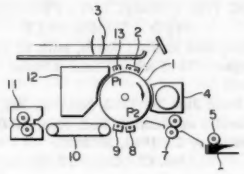
Haruo Iwahashi, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1982, Ser. No. 445,996

Claims priority, application Japan, Dec. 3, 1981, 56-195146

Int. Cl.³ G03G *15/16*

U.S. Cl. 355—14 TR **2 Claims**



1. A controlling method for transferring and separation of a transfer medium in an electrophotographic copying apparatus with an electrostatic separation system characterized in that an area to be neutralized by the separation electrode is charged by the transferring electrode that is located immediately before the separation electrode, wherein timing intervals ΔT (sec.) and ΔT' (sec.) of the control signals that take charge of ON/-OFF operation for the transferring electrode and the separation electrode satisfy the following inequalities when the line speed of the image holder is V (mm/sec.), effective discharge widths of the transferring electrode and the separation electrode are Wt (mm) and Wd (mm) respectively, discharge rise time for the transferring electrode and the separation electrode are Tt (sec.) and Td (sec.) respectively, breaking time are Tt' (sec.) and Td' (sec.) and the distance between two aforesaid electrodes on the image holder is L (mm):

$$\Delta T \geqq (L + Wd/2 - Wt/2)/V + (Tt - Td)$$

$$0 \leqq \Delta T' \leqq (L + Wd/2 - Wt/2)/V + (Tt' - Td').$$

4,540,276

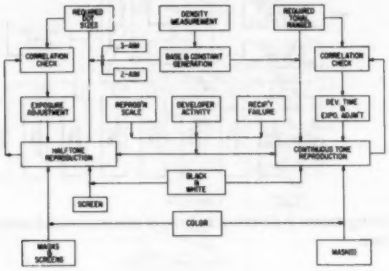
COLOR PHOTOGRAPHIC REPRODUCTION SYSTEM

Clarence S. Ost, 7905 Bayshore Dr., Margate City, N.J. 08402

Continuation-in-part of Ser. No. 363,070, Mar. 29, 1982. This application Sep. 30, 1983, Ser. No. 537,702

Int. Cl.³ G03B *27/80*

U.S. Cl. 355—38 **25 Claims**



1. In a stepwise procedural light-integrating system of photographic exposure control, wherein a human operator causes densitometric data to be supplied to apparatus adapted to store retrievably and to process such data for quality photo-reproduction of copy in color, the improvement comprising making color-correction masks for respective colors to compensate for color-impurity of correspondingly colored inks, including densitometrically probing highlight, midtone, and shadow regions of a mask negative developed for a trial time after having been exposed for a trial number of light units, for subsequent superimposition with a corresponding color-separation negative of the copy to be reproduced prepared by photographing such copy through a filter of complementary color.

4,540,277

DEVICE FOR THE PROJECTION PRINTING OF MASKS INTO A WORKPIECE

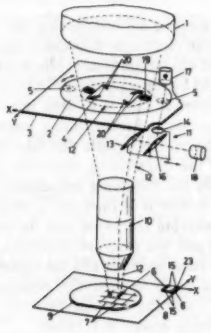
Herbert Mayer, and Ernst Löbach, both of Eschen, Liechtenstein, assignors to Perkin-Elmer Censor Anstalt, Vaduz, Liechtenstein

Filed Jun. 24, 1983, Ser. No. 507,549

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225746; May 25, 1983, 3318980

Int. Cl.³ G03B *27/42*

U.S. Cl. 355—53 **7 Claims**



1. A device for the projection printing of masks onto a workpiece, particularly onto a semiconductor substrate for the production of integrated circuits, the patterns of the masks being imaged on a photosensitive layer of the workpiece via a projection lens by exposure light, and mask and workpiece being aligned relative to each other by imaging alignment patterns of the mask by means of adjustment light through the projection lens for the formation of an adjustment signal, said device comprising an adjustment plate insertable below the projection lens instead of the workpiece, said adjustment plate having light-transmitting zones conjugated with recesses in said mask in respect of said projection lens in exposure light,

photometer means arranged below said light-transmitting zones.

4,540,278

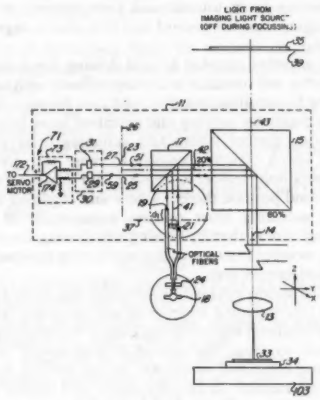
OPTICAL FOCUSING SYSTEM

Edward H. Phillips, Middletown, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Continuation of Ser. No. 491,722, May 5, 1983, abandoned, which is a division of Ser. No. 183,402, Sep. 2, 1980, Pat. No. 4,383,757, which is a continuation of Ser. No. 25,917, Apr. 2, 1979, abandoned. This application Aug. 8, 1984, Ser. No. 638,709

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—55 **16 Claims**



1. An optical focusing system for positioning an image plane of an imaging lens at a reflective surface of a workpiece, said system comprising:

source means for directing first and second beams of light through the imaging lens and towards the reflective surface of the workpiece to form first and second input images of portions of the source means at selected distances from the image plane of the imaging lens so that light reflected from the reflective surface of the workpiece is reimaged by the imaging lens to form first and second output images of the first and second input images, respectively, at positions determined by the relative spacing between the reflective surface of the workpiece and the image plane of the imaging lens;

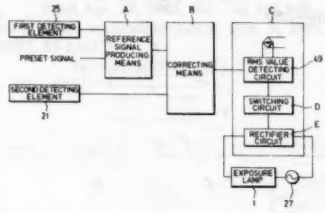
detector means, responsive to the positions of the first and second output images, for producing a control signal having a magnitude and a polarity indicative of the position of the reflective surface of the workpiece relative to the image plane of the imaging lens; and

positioning means, repsonsive to the control signal from the detector means, for positioning the image plane of the imaging lens at the reflective surface of the workpiece.

4,540,279
AUTOMATIC EXPOSURE DEVICE

Yoichiro Irie, Suita; Yutaka Shigemura, Takarazuka, and Satoshi Namba, Ibaraki, all of Japan, assignors to Mita Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 27, 1984, Ser. No. 635,028
Claims priority, application Japan, Jul. 30, 1983, 58-139962
Int. Cl.³ G03B 27/72
U.S. Cl. 355—69 8 Claims

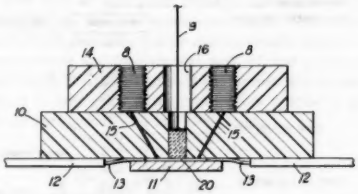


1. An automatic exposure device comprising lamp light quantity detecting means for detecting the light quantity of an exposure lamp, density detecting means which receives the reflected light from a region of a document located forwardly of a region of the document being exposed to detect the density of the first region, reference signal producing means which uses as its input signal the output signal from said lamp light quantity detecting means to produce a reference signal, correcting means which uses as its inputs the output signal of the density detecting means and the reference signal to correct the output signal of the density detecting means correspondingly to an increase in the lamp light quantity, and lamp control means which uses as its input the output signal of the correcting means to control the conducting-angle of the exposure lamp.

4,540,280
FIBER OPTIC THIN-LAYER CELL

James L. Anderson, and Jeffrey D. Brewster, both of Athens, Ga., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Dec. 1, 1982, Ser. No. 445,959
Int. Cl.³ G01N 21/01
U.S. Cl. 356—246 63 Claims



54. A method of spectrophotometrically analyzing liquid or gaseous matter, which comprises the steps of:

(a) introducing the matter to be analyzed into a thin planar enclosed cell;

(b) directing light from a source into the cell generally parallel to the plane of the thin cell by sending the source of light into one end of a bundle of optical fibers, and forming the other end of the bundle into a flat array of spread out optical fibers, and directing the light from the array into the thin cell with the plane of the array being the same plane as the thin cell;

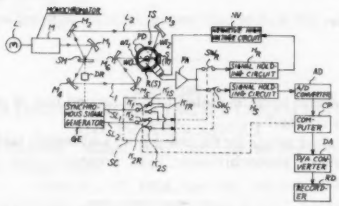
(c) directing the light which passes through the cell and the matter to be analyzed into another flat array of optical fibers which form an optical fiber bundle; and

(d) directing the light emanating from the other end of the bundled fibers to a light detection device for analysis of the light.

4,540,281
DOUBLE-BEAM SPECTROPHOTOMETER

Osamu Akiyama, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Mar. 21, 1983, Ser. No. 477,523
Claims priority, application Japan, Aug. 30, 1982, 57-151046
Int. Cl.³ G01J 3/42
U.S. Cl. 356—325 6 Claims



1. A double-beam spectrophotometer comprising:

means for providing a first and a second light beam; an integrating sphere provided with a first pair of windows in which a sample and a reference are detachably and exchangeably set and a second pair of windows so arranged relative to said first pair of windows that one of said first and second light beam entering said integrating sphere through one of said second pair of windows impinges perpendicularly on one of said sample and reference set in the corresponding one of said first pair of windows while the other of said first and second light beams entering said integrating sphere through the other of said second pair of windows impinges aslant on the other of said reference and sample set in the other of said first pair of windows; and means for measuring the light emerging from said integrating sphere and wherein one of said second pair of windows of said integrating sphere is arranged at a position diametrically opposite to one of said first pair of windows while the other of said second pair of windows is laterally displaced from the position diametrically opposite to the other of said first pair of windows.

4,540,282
APPARATUS FOR OPTICALLY ANALYZING A SAMPLE

Isaac J. Landa, 12109 Greenleaf Ave., Potomac, Md. 20854, and Ronald Shideler, Rockville, Md., assignors to Isaac Landa, Rockville, Md.

Filed Mar. 21, 1983, Ser. No. 477,634
Int. Cl.³ G01J 3/18, 3/42
U.S. Cl. 356—328 20 Claims

1. Apparatus for optically analyzing a sample, comprising:

(a) first means for generating light having a preselected spectrum of wavelengths, and for focussing said spectrum onto an entrance plane;

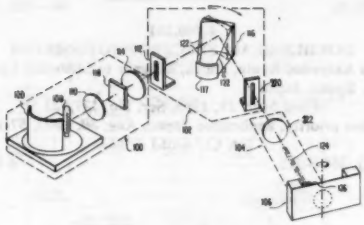
(b) monochrometer means disposed to receive said spectrum focussed onto said entrance plane for providing a spectral scan of monochromatic light onto an exit plane, comprising:

(i) a torque motor having a drive shaft, said drive shaft having a first end and a second end;

(ii) means for diffracting said spectrum focussed onto said entrance plane into said spectral scan of monochrmatic light provided onto said exit plane, said means for diffracting attached to said first end of said drive shaft;

(iii) a support having a first end and a second end, said first end effectively attached to said torque motor;

(iv) spring means having a first end and a second end, said first end of said spring means attached to said second end of said support, said second end of said spring



means being mounted to said second end of said drive shaft; and

(c) second means for focussing onto said sample said spectral scan of monochromatic light provided onto said exit plane.

4,540,283

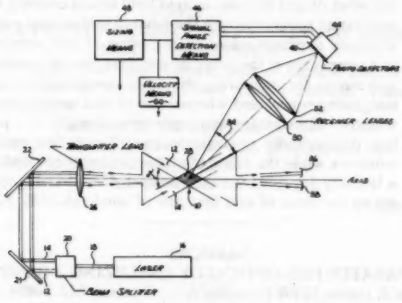
APPARATUS AND METHOD FOR DETERMINING THE SIZE AND VELOCITY OF PARTICLES, DROPLETS, BUBBLES OR THE LIKE USING LASER LIGHT SCATTERING

William D. Bachalo, 14660 Saltamontes Way, Los Altos Hills, Calif. 94022

Filed Jun. 20, 1983, Ser. No. 506,108

Int. Cl.³ G01N *15/02*

U.S. Cl. 356—336 **26 Claims**



18. A method for sizing a particle, droplet, bubble or the like, employing laser light scattering, comprising the steps of:

generating first and second laser beams;

directing said first and second laser beams along an axis, and causing said beams to cross said axis at an angle to establish a sample volume between said pair of laser beams;

sensing the scattered signal of said pair of laser beams caused by a particle, droplet, bubble or the like passing through said sample volume;

determining the phase of said scattered signal as said particle, droplet, bubble or the like passes through said sample volume;

determining the size of said particle, droplet, bubble or the like from phase changes in said scattered signal;

whereby the size of a particle, droplet, bubble or the like is determined from the phase changes of said scattered signal.

4,540,284

RING LASER INCLUDING REFLECTING MIRROR WITH PHASE ROTATING GARNET LAYER

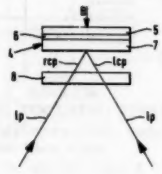
Rolf Gauert, Brunswick, and Werner W. Jungbluth, Munster, both of Fed. Rep. of Germany, assignors to Deutsch Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e. V., Cologne, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,573

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1981, 3115906

Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 **4 Claims**



1. A ring laser having at least three corner mirrors of which one requires circularly polarised light to be incident thereon, said one corner mirror including a substrate having a ferromagnetic garnet layer thereon, the garnet layer being magnetised to saturation in a direction perpendicular to that layer, and a plurality of superimposed highly reflecting interference layers on the surface of the garnet layer facing the incident circularly polarised light, the interference layers having a reflectivity of approximately 99.4% and permitting approximately 0.6% of the incident light to pass through into the garnet layer, the passed small fraction of the light being sufficient to enable the desired bias or phase shift to be achieved.

4,540,285

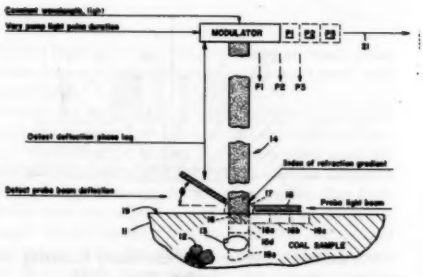
PHOTOTHERMAL METHOD OF DETERMINING CALORIFIC PROPERTIES OF COAL

Nabil M. Amer, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 16, 1983, Ser. No. 495,205

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—432 **10 Claims**



1. In a method of evaluating the calorific value of a coal sample, the steps comprising:

generating a predetermined quantity of heat within a predetermined surface region of said coal sample by directing light into said surface region,

detecting the resulting heat transfer from said sample into the medium adjacent said region by detecting thermally induced changes of the index of refraction of said medium adjacent said region, and

utilizing said changes of index of refraction as an indicator of said calorific value.

4,540,286

APPARATUS FOR CONTINUOUSLY MEASURING THE DEGREE OF MILLING OF GRAINS

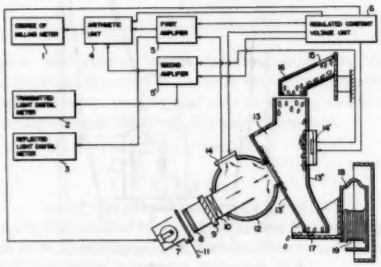
Toshihiko Satake, and Yukio Hosaka, both of Higashihiroshima, Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,808

Claims priority, application Japan, Jun. 3, 1982, 57-94063; Jul. 6, 1982, 57-116175

Int. Cl.³ G01N *21/47, 21/13*

U.S. Cl. 356—445 **4 Claims**



1. An apparatus for continuously measuring the degree of milling of grains comprising

a light source unit directing light to be reflected by and transmitted through the grains,

a grain passage unit disposed in the path of said light and having a first wall disposed at the near side from said light source unit and a second wall disposed at the far side from said light source unit,

a reflected light detecting unit having a reflected light sensing element positioned adjacent to said first wall,

a transmitted light detecting unit having a transmitted light sensing element adjacent to said second wall,

an arithmetic unit connected to said reflected light detecting unit and said transmitted light detecting unit, and

a degree of milling meter connected to said arithmetic unit,

said first wall of said grain passage unit being positioned angularly so that the grains in contact therewith slide down with their lengthwise axes generally parallel to the wall surface and said second wall of said grain passage unit being positioned so that the grains which are introduced in said grain passage unit flow without a gap between the second wall and the grains.

4,540,287

ASPHALT RECYCLING

Vladimiros Servas, and Wilhelm P. H. Voors, both of Pretoria, South Africa, assignors to South African Inventions Development Corp., Province, South Africa

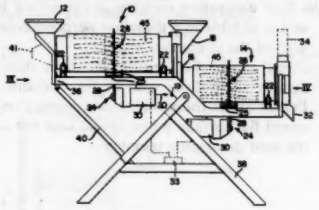
Filed Dec. 1, 1983, Ser. No. 556,891

Claims priority, application South Africa, Dec. 2, 1982, 82/8885

Int. Cl.³ B28C *5/46*

U.S. Cl. 366—7 **8 Claims**

1. A method of recycling asphalt, which comprises heating aggregate in a rotating heating zone by a burner flame, supplying the heated aggregate to and introducing reclaimed asphalt and suitable binder material into a rotating, separately rotatable flame-free mixing zone, and there mixing these constituents to produce a usable hot asphalt pavement mix wherein the heated aggregate and flame-free combustion gases from the heated



zone pass through the mixing zone also to heat the reclaimed asphalt.

4,540,288

APPARATUS FOR PRODUCING ICE CREAM UTILIZING THE PELTIER EFFECT

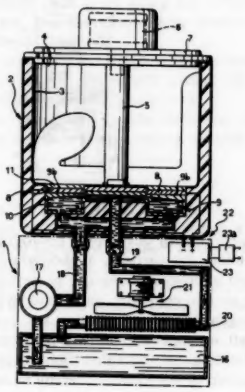
Alberto Pandolfi, Milan, Italy, assignor to Brevetti Gaggia S.p.A., Milan, Italy

Filed Jul. 25, 1984, Ser. No. 634,417

Claims priority, application Italy, Aug. 1, 1983, 53616/83[U]; Nov. 22, 1983, 53964/83[U]; Nov. 22, 1983, 53965/83[U]

Int. Cl.³ A23G *9/00*

U.S. Cl. 366—145 **21 Claims**



1. An ice cream making machine, comprising:

a container for the ice cream;

a stirrer located within the container;

means for rotating the stirrer, and

a refrigeration unit including heat dissipation means and a plurality of Peltier effect thermo-elements, each of said thermo-elements having a flat side in contact with a wall of the container and an opposite flat side in contact with said heat dissipation means,

wherein the improvement consist in:

the Peltier effect thermo-elements are located between a lower surface of a bottom wall of the container and said heat dissipation means;

the lower surface of the bottom wall of the container has a plurality of raised flat surface portions, in correspondence with the Peltier effect thermo-elements,

the heat dissipation means includes a member which provides a surface having a plurality of flat zones in contact with the Peltier effect thermo-elements, each of said raised flat surface portions and each of said flat contact zones

having respective surface areas at least equal to the surface area of each side of each Peltier effect thermo-element,

the heat dissipation member is connected to the container and is slidable in a direction perpendicular to the bottom wall of the container, and

resilient means for urging the heat dissipation member against the bottom wall of the container to clamp said Peltier effect thermo-elements respectively between said raised flat surface portions and said flat contact zones of the heat dissipation member.

4,540,289

AUTOMATIC STIRRING SYSTEM FOR FILM DEVELOPING

Richard M. H. Cheng, Notre Dame de Grace, and Rock S. Lee, St. Hubert, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 320,559, Nov. 12, 1981, abandoned. This application Jan. 27, 1984, Ser. No. 574,407

Int. Cl.[3] **G03D** *3/04;* **B01F** *13/08*

U.S. Cl. 366—274 **3 Claims**

1. An apparatus for developing photographic film comprising a container for carrying a photographic film developer solution and photographic film to be developed, a detachable screw cap on said container, an agitator within said container for agitating said developer solution, said agitator comprising a central shaft, an upper and a lower perforated disk for receiving and holding photographic film to be developed each fixedly secured to said shaft to thereby move with said shaft, a first magnetic disk encapsulated in plastic fixedly secured to said shaft whereby said shaft moves when said first magnetic disk moves, and drive means for imparting motion to said first magnetic disk, said drive means including housing means having an upper and lower support, a motor having a drive shaft positioned by said lower support of said housing means, a circular crank coupled to said motor drive shaft, a connecting rod having a first and second end secured at said first end to said crank near the periphery thereof, a block having a groove therein secured to said upper support of said housing means, a rack slider disposed in said groove in said block for slidable movement therein, said rack slider being secured to said second end of said connecting rod, a pinion support secured to said upper support of said housing means, a pinion gear carried by a shaft rotatably mounted in said pinon support, said pinion gear being in meshing engagement with said rack slider, second magnetic means secured to said shaft carrying said pinion gear thereby contributing movement to said second magnetic means based on the movement of pinion gear and rack slider, said first magnetic means and second magnetic means being positioned whereby motion of said second magnetic means will cause corresponding motion to said first magnetic means.

4,540,290

IMMERSIBLE AERATOR AND/OR MIXER APPARATUS

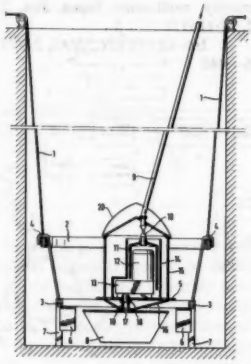
Erkki J. Järvinen; Pekka M. Taskinen; Jarmo J. Pullo, all of Outokumpu; Seppo T. Kinnunen, Espoo, and Arvo E. Andersson, Outokumpu, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Feb. 1, 1984, Ser. No. 576,040

Claims priority, application Finland, Feb. 2, 1983, 830354

Int. Cl.[3] **B01F** *7/16*

U.S. Cl. 366—286 **9 Claims**



1. An immersible apparatus for agitating liquid, comprising an operation unit and an agitator unit, said operation unit having an outer casing, inlet means for supplying gas under pressure to the outer casing, a motor enclosure disposed within the outer casing in spaced relationship with respect thereto, a motor disposed within the motor enclosure and operatively connected to the agitator unit, and outlet duct means for conducting gas from the space between the outer casing and the motor enclosure to leave the apparatus by way of the agitator unit, said inlet means including a non-return valve for preventing gas from leaving the outer casing by way of the inlet means, said valve, said outer casing and said motor enclosure together defining a gas trap which, in the event of interruption in the supply of gas to the outer casing, prevents liquid that enters the operation unit by way of the agitator unit from contacting the motor.

4,540,291

HOROLOGY MODULE COMPRISING AN ELECTRONIC CIRCUIT AND A CALENDAR DEVICE

Jean-Daniel Dubois, L'Orient, France, assignor to Nouvelle Lemania S.A., Vaud, Switzerland

PCT No. PCT/CH82/00128, § 371 Date Aug. 16, 1983, § 102(e) Date Aug. 16, 1983, PCT Pub. No. WO83/02340, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 3, 1982, Ser. No. 527,518

Claims priority, application Switzerland, Dec. 28, 1981, 8313/81

Int. Cl.[3] **G04B** *19/24*

U.S. Cl. 368—28 **5 Claims**

1. A timepiece mechanism comprising:

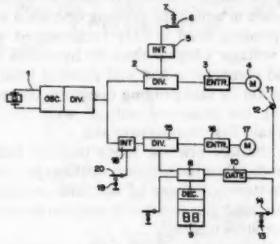
a time standard;

a time display gear train controlled by said time standard and having at least one time displaying gear and a synchronizing rotary part, said synchronizing rotary part comprising a packing portion made of an insulating material and a metal grounding contact element secured to said packing portion;

date displaying means for displaying a date; and

electronic control means for controlling said date displaying means, said electronic control means comprising an elastic

contact blade biased into continuous contact with said synchronizing rotary part and alternately contacting said packing portion and said grounding element at predetermined times during rotation of said synchronizing rotary



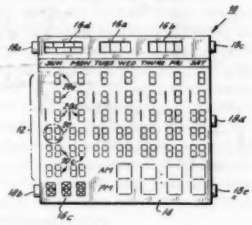
part, said control means detecting grounding of said contact blade when it contacts said grounding element and thereupon causing said date displaying means to advance the date displayed thereon by one unit.

4,540,292

ELECTRONIC CALENDAR DISPLAY

Charles P. Rubenstein, Massapequa; Jeffrey S. Nevid, Bayside, both of N.Y., and Spencer A. Rathus, Princeton, N.J., assignors to Psytronics Associates, Princeton, N.J.

Filed Dec. 28, 1983, Ser. No. 566,204
Int. Cl.[3] G04B *19/24*; G04C *19/00*
U.S. Cl. 368—29 **35 Claims**



1. A device for displaying calendar data, comprising:

a display for displaying data, comprising a first plurality of rows of discrete display elements, each display element in each row being in a respective column, each column always displaying a particular day of the week which is unique to that column such that each respective column always displays the same day of the week even when the data being displayed is changed by an updating circuit, each display element being selectively activable to display one of a plurality of date symbols, each date symbol representing a day of a month, the rows being arranged parallel to each other for displaying the calendar weeks of a month; and

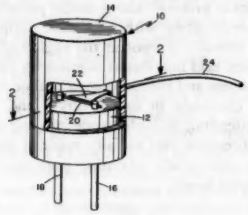
said updating circuit being for updating said display and for selectively activating the display elements to display the date symbols representing the days of each calendar week of the current month in a respective row and to display the date symbol representing each day of the current month in the column always displaying the day of the week on which that day falls, said updating circuit further being for automatically updating said display at the end of each current month to display the date symbols corresponding to the days of the following month.

4,540,293

DIELECTRIC HEAT SENSOR

Marvin W. Shores, Pomona, Calif., assignor to General Dynamics Pomona Division, Pomona, Calif.

Filed Sep. 19, 1983, Ser. No. 533,082
Int. Cl.[3] G01J *5/00*
U.S. Cl. 374—130 **2 Claims**



1. A dielectric heat sensor for monitoring the temperature of a bridgewire of an explosive device at substantially each point along said bridgewire's entire length without interfering with the electromagnetic environment, said bridgewire responding by temperature change to electromagnetic radiation; said sensor comprising:

a plurality of dielectric optical waveguide means for position adjacent said bridgewire along substantially the entire length of said bridgewire for receiving infrared waves from substantially each point along the entire length of said bridgewire, and for transmitting received infrared waves to a remote location;

remotely positioned infrared detector means connected to said dielectric optical waveguide means for detecting infrared waves transmitted thereto; and

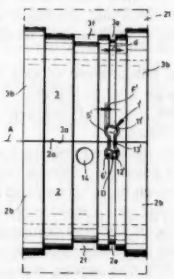
indicator means responsive to the detection of infrared waves by said detector for generating a signal.

4,540,294

SPLIT BEARING SHELL

Heinrich Lamperski, Mühlheim, and Paul Gerling, Oberhausen, both of Fed. Rep. of Germany, assignors to Glyco Maschinenbau-GmbH, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 373,804, Apr. 30, 1982, abandoned. This application Jun. 2, 1983, Ser. No. 500,293
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117422
Int. Cl.[3] F16C *33/04*, *33/60*
U.S. Cl. 384—273 **7 Claims**



1. A bearing shell split into two substantially semicylindrical half-shells jointly receivable in an annular interspace between an outer member and in inner member movable relatively to each other, said half-shells having two pairs of end faces confronting each other across a parting plane, said half-shells

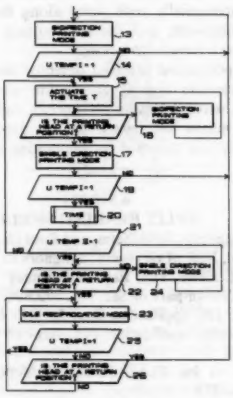
being positively interconnected by screwless link means extending across said parting plane in a region of at least one of said pairs of end faces, said screwless link means engaging at least one of said half-shells with sufficient play to enable limited relative displacement of said half-shells parallel and perpendicular to said parting plane upon insertion into said interspace but preventing separation of said half-shells upon removal thereof from said interspace, said half-shells having aligned peripheral grooves along outer peripheries of said half-shells communicating with respective peripheral depressions disposed laterally thereof in the region of each of said pairs of end faces, said link means comprising unitarily a strip of uniform thickness and handle-shaped outline having a body received with clearance in said grooves and having disk-shaped heads extending with clearance into and received with play in said depressions and radially retained therein by said outer members, said heads adjoining portions of said body narrower than said heads.

4,540,295

METHOD FOR CONTROLLING THE TEMPERATURE OF THE PRINTING HEAD OF AN IMPACT PRINTER

Mizuho Okunishi, and Makoto Yasunaga, both of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,678
Claims priority, application Japan, Dec. 6, 1983, 58-229145
Int. Cl.³ B41J *3/02*
U.S. Cl. 400—120 **1 Claim**



1. A method of controlling temperature of a printing head of an impact printer in which said printing head usually performs bidirectional printing operation, said method comprising the steps of:

(a) measuring the temperature of said printing head by a temperature sensor attached tereto;

(b) converting the measured temperature into a voltage corresponding thereto;

(c) transferring the measured voltage both to an input of a first comparator having a reference voltage and a hysteresis voltage and to an input of a second comparator having a reference voltage and a hysteresis voltage respectively higher than those of said first comparator;

(d) comparing the measured voltage with the reference voltage of said first comparator, when the measured voltage becomes higher than said reference voltage to actuate a timer;

(e) changing the bidirectional printing mode into a single direction printing mode in which the printing operation is done in only one of reciprocation of said printing head when said printing head gets to a return position under actuated state of said timer by making use of printing operation control means;

(f) comparing the measured voltage with the reference voltage of said second comparator at the termination of a time preset by said timer;

(g) changing the single direction printing mode into an idle printing mode in which the printing operation is not done and said printing head is only reciprocated when said measured voltage is higher than the hysteresis voltage of said second comparator and said printing head gets to a return position by said printing operation control means;

(h) comparing the measured voltage with the hysteresis voltage of said first comparator; and

(i) changing the idle printing mode into the bidirectional printing mode when the measured voltage becomes lower than the hysteresis voltage of said first comparator and said printing head gets to a return position by said printing operation control means;

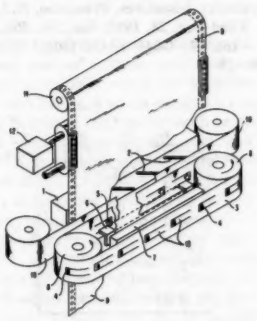
whereby the temperature of said printing head is regulated so as to prevent said printing head from overheating.

4,540,296

BAR BAND INTERSECTIONAL MATRIX PRINTER

William D. Thorne, Wake Forest, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 333,090, Dec. 21, 1981, abandoned.
This application Jul. 5, 1983, Ser. No. 484,734
Int. Cl.³ B41J *3/12, 1/20*
U.S. Cl. 400—121 **4 Claims**



1. A dot matrix printer comprising:

a fixed platen having at least one raised ridge on an impact face thereof said raised ridge being relatively elongated measured along the line of printing;

a movable carrier means being provided with at least one raised edge font member of a first relatively narrow width measured along the line of printing, said carrier means being arranged to traverse the face of said raised ridge on said fixed platen and positioned relative thereto to be generally parallel with and along a desired printing line;

at least one print hammer having an impact face elongated, to a second width measured along the line of printing, said second width being substantially greater than said first width and oriented parallel with the intended printing line; and

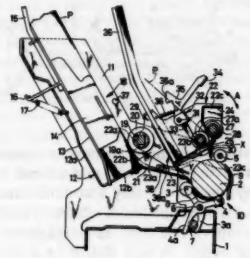
means for driving said print hammer to impact said movable carrier to deflect said raised ridge font member thereon into contact with a third relatively narrow area of paper to deflect said area of paper into contact with said raised ridge portion of said platen, said third width being substantially less than said second width a dot having an area substantially less than that of either raised ridge being formed of the size and shape corresponding to the area of impact between said raised ridge font member's impact face and said raised ridge of said platen.

4,540,297

PAPER HOLDING, FEEDING AND INSERTING APPARATUS FOR A PRINTER USING DIFFERENT KINDS OF SHEETS

Mamoru Imaizumi, and Susumu Kuzuya, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 1, 1983, Ser. No. 462,953
Int. Cl.³ B41J *13/10*
U.S. Cl. 400—625 **19 Claims**



1. A paper feeding apparatus for a printer having a printing assembly, which comprises:

a frame secured to said printer;

a first paper handling assembly supported by said frame and having a first paper stacker for storing sheets of paper of one kind and a paper feeding device for feeding said sheets of paper of one kind from said first paper stacker along a first paper inlet path to said printing assembly;

a second paper handling assembly having a second paper stacker for receiving said sheets of paper of one kind after they are printed by said printing assembly; and

support means, retained by said frame for supporting said second paper handling assembly pivotally between a first position at which the second paper handling assembly is operative to receive the printed sheets of paper of said one kind in said second paper stacker, and a second position at which the second paper handling assembly is inoperative and a second paper inlet path leading to said printing assembly is provided adjacent said second paper handling assembly, a pivotal movement of said second paper handling assembly between said first and second positions being effected without a pivotal movement of said first paper handling assembly,

whereby sheets of paper of another kind different from said one kind are loaded to said printing assembly along said second paper inlet path when said second paper handling assembly is placed in its second position.

4,540,298

MANUALLY LOADED ENVELOPE FEEDER

Howard H. Kulow, Berea, Ohio, assignor to Rowan Corporation, Fairview Park, Ohio

Filed Nov. 28, 1984, Ser. No. 675,635
Int. Cl.³ B41J *13/10*
U.S. Cl. 400—635 **17 Claims**

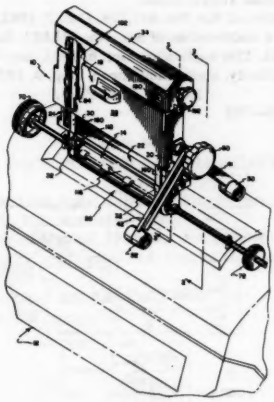
1. An envelope feeder for use with a printer, wherein (1) the printer is of the type that has a printing station wherein pieces of stationery may be positioned for printing, (2) the printer has a platen roll that is rotatable about a first axis of rotation that is fixed relative to drive components of the printer when the platen roll is drivingly connected to such drive components of the printer, and (3) the printer's platen roll is removable from connection with such drive components of the printer, the envelope feeder being (1) substitutable for the printer's removable platen roll, (2) connectable to drive components of the printer, and (3) operable to serially feed envelopes to the printer's printing station in response to operation of drive components of the printer so that envelopes may be addressed one at a time while they are in the printing station, the envelope feeder comprising:

(a) housing means including an elongate upstanding housing having structure that defines an upper end region, a lower end region, and opposed front and rear guide surfaces that extend between the upper and lower end regions;

(b) replacement platen roll means rotatably connected to the lower end region of the housing and including a replacement platen roll that is configured to be received by and drivingly connected to drive components of the printer in substitution for the printer's removable platen roll, and of being rotated by the printer's drive components about the first axis of rotation;

(c) idler roll means including an idler roll that is rotatably connected to the upper end region of the housing for rotation about a second axis of rotation that extends substantially parallel to the first axis of rotation;

(d) transport belt means including at least two transport belts that have reaches which extend along the front and rear guide surfaces of the housing, and that extend around and are held taut by the replacement platen roll and the idler roll, the transport belts having outer surfaces that cooperate to define an endless loop travel path which extends along the front and rear guide surfaces of the housing means and around the replacement platen roll and the idler roll;



(e) receiving means defining a loading station located along the front guide surface of the housing means, the receiving means including door means movably connected to the housing means for pivotal movement relative thereto between an open position wherein an envelope to be addressed can be inserted between the door means and the front guide surface, and a closed position wherein an inner surface of the door means extends parallel to the front guide surface of the housing means and cooperates therewith to position an inserted envelope along the travel path;

(f) drive formation means carried by the transport belts for engaging trailing edge portions of envelopes that are positioned along the travel path for moving envelopes sequentially along the travel path from the loading station to the printing station and thence to a discharge station as the belts are caused to move in response to rotation of the replacement platen roll by the printer;

(g) guide means for cooperating with the transport belts, with the replacement platen roll, with the idler roll, and with the housing means to maintain positioning of envelopes along the travel path as the envelopes are being moved from the loading station to the printing station and thence to the discharge station; and,

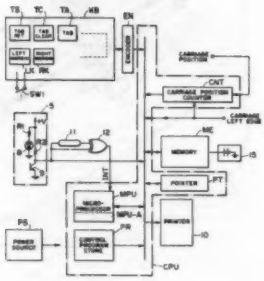
(h) the printing, discharge and loading stations being located forwardly of the front guide surface at closely spaced positions along the travel path, with the loading station being located above the printing station, and with the discharge station being located between the loading and printing stations, whereby an operator can readily attend to both manual loading of envelopes one at a time at the loading station and manual removal of envelopes one at a time at the discharge station while also monitoring the addressing of envelopes as it takes place at the printing station.

4,540,299

MARGIN AND TAB STOP DETERMINING APPARATUS RESPONSIVE TO PAGE EDGE SENSOR

Yasuaki Yamada, Funabashi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 447,519, Dec. 7, 1982, abandoned, which is a continuation of Ser. No. 173,887, Jul. 31, 1980, abandoned. This application Oct. 6, 1983, Ser. No. 539,468
Claims priority, application Japan, Aug. 9, 1979, 54-100760
Int. Cl.³ B41J *29/42*
U.S. Cl. 400—708 **7 Claims**



1. A printer, in which a mounting position of a recording member can be freely selected, comprising:

printing means for printing on the recording member;

detecting means for detecting a predetermined position of said recording member relative to a reference position;

a bail having a holding position for holding said recording member in operative relation to said printing means;

switch means for detecting the position of said bail;

a carriage on which said printing means and said detecting means are mounted, said carriage being mounted for movement in one direction relative to the recording member in response to detection by said switch means that said bail is in the holding position thereof and from a turning position in a different direction relative to the recording member after said movement in said one direction; and

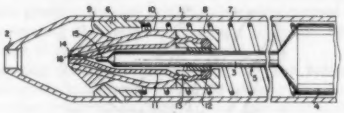
control means for controlling said movement of said carriage, said control means inhibiting detection by said detecting means during said movement in said one direction, enabling detection by said detecting means during movement of said carriage in said different direction and stopping said carriage at a desired stop position relative to said predetermined position.

4,540,300

RETRACTABLE CAPLESS MARKING PEN

Yoshio Midorikawa, Tokyo, Japan, assignor to Toyo Polymer Co., Ltd., Tokyo and Kotobuki & Co., Ltd., Kyoto, both of, Japan

Filed Feb. 24, 1984, Ser. No. 583,306
Claims priority, application Japan, Feb. 25, 1983, 58-30465
Int. Cl.³ B43K *9/00*
U.S. Cl. 401—107 **2 Claims**



1. A knock-type writing instrument comprising:

(a) a sheath having a back end and a front end;

(b) a writing member slidably accommodated in said sheath and having a front portion of relatively small diameter and a rear portion of relatively large diameter;

(c) actuating means on said sheath back end for actuating said writing member between a writing position and a non-writing position;

(d) protrusion means mounted within said sheath in the front end thereof;

(e) an elastic cylinder having an annular opening and covering a part of said writing member;

(f) an elastic pressing member surrounding said elastic cylinder; and

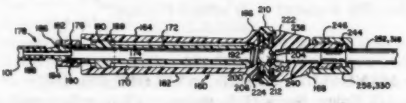
(g) means on said elastic pressing member interacting with said protrusion means and operative to contact said pressing member about said elastic cylinder when said writing member is actuated to said non-writing position to thereby seal said pressing member about said elastic cylinder and to close said annular opening to thereby seal said elastic cylinder about said writing member.

4,540,301

APPARATUS FOR APPLYING LIQUID COATINGS

Dennis E. Swanson, Rte. 3, Box 143 K, Buffalo, Minn. 55313, and Robert D. Lerum, 6641 Berkshire La., Maple Grove, Minn. 55369

Filed Dec. 16, 1983, Ser. No. 562,180
Int. Cl.³ B05C *17/02*
U.S. Cl. 401—146 **6 Claims**



1. Apparatus for applying liquid coating comprising a pump to draw said coating from a container and provide a pressurized flow of said coating through hosing to a handle unit connecting with an applicator, an improvement of said handle unit including,

a handle portion having a gripping section formed with an inner space, a flow control section connecting with said gripping section and an attaching section connecting with said flow control section,

a handle fitting disposed in said gripping section inner space with an inner end of said fitting engaging an inner end wall of said gripping section inner space to form a seal therewith and with threads formed adjacent to an outer end of said fitting to engage with threads formed as part of said gripping section inner space and provide a connection

spaced from said seal, and said fitting outer end prepared for assembly with a disconnect fitting,

a spring having an end carried in a recess formed on said handle fitting inner end,

a ball valve positioned in a valve space formed in said handle portion flow control section and engaging with an opposite end of said spring to seal against a beveled end wall of said valve space, said valve space connecting with an inner passage in said handle fitting,

flow control devices comprising a pair of pushbuttons positioned one each in pushbutton spaces formed respectively on opposite sides of said valve space and connecting therewith, each said pushbutton having a stem engageable with said ball valve to respectively and in combination disengage said ball valve from said valve space beveled end wall and a head portion biased outwardly by a spring in said pushbutton space to engage an outer ring on said pushbutton head portion with a flange formed at an outer end of said pushbutton space respectively, each said spring maintained free from contact with said coating by a sealing ring carried on each said pushbutton stem,

a passageway formed in said handle portion attaching section and connecting with said valve space, said passageway including a tapered section positioned adjacent to said valve space and a pair of opposingly positioned recesses formed in said passageway, and

threads formed on said attaching section adjacent to an outer end of said attaching section,

wherein during apparatus use said handle fitting seal-connection spacing resisting external forces applied by said hosing attached to said disconnect fitting to maintain said handle fitting and said handle portion gripping section in leakproof relationship and an inlet of said applicator and an inlet of an extension being selectively secured in said attaching section passageway with said passageway tapered section engaging with a tapered end of said inlet to form a seal therewith, said passageway recesses engaging with protuberants formed on said inlet to maintain a position of said applicator and said extension in a selective relationship with said handle unit pushbuttons, and said handle unit attaching section threads forming a connection with a nut carried by said inlet spaced from said seal, said seal-connection spacing and said protuberant-recess engagement resisting external forces applied to said applicator and said extension to maintain said inlet and said handle unit attaching section in a leakproof relationship.

4,540,302

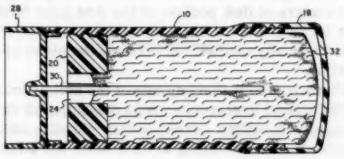
APPLICATOR DEVICE

Robert E. Bonazzo, 27 Bonazzo Dr., Trumbull, Conn. 06611

Filed Apr. 21, 1983, Ser. No. 487,450

Int. Cl.³ B43K *5/06, 21/08*

U.S. Cl. 401—173 **1 Claim**



1. An applicator device comprising:

an exterior vertical hollow cylinder open at both upper and lower ends and having an internally threaded inner wall;

an interior cylindrical member having an externally threaded outer wall and being disposed vertically within said cylinder with said external thread engaging the inner thread, said member and said cylinder having a common axis, said member being much shorter in length than said cylinder and having flat upper and lower ends, said member being rotatable about said axis and moving within the cylinder up and down along said axis as said member is rotated, the direction of travel being determined by the direction of rotation, said member having a vertical bore aligned with said axis and extending through said member, said bore having a vertical slotted region;

a vertical cylindrical bottom cover rotatably disposed within the lower end of the cylinder and having a vertical extension shaped to non rotatably engage the slotted region of said bore, said extension extending through said region whereby as the cover is rotated, said member is rotated and moves along the axis of the cylinder;

a hollow cap removably secured to the upper end of the cylinder and spaced from said cover, the cap having a smooth threadless inner wall; and

a solid vertical cylinder of disposable applicator material disposed in the vertical hollow cylinder, the solid cylinder having a lower end resting on said member and an upper end disposed within said cap, said member extending upwardly through said bore into the solid cylinder, said solid cylinder having an externally threaded outer wall which engages said inner thread and also having a smooth unthreaded continuation of the threaded outer wall extending into said cap.

4,540,303

PEN NIB WITH POWDER-GASPHASE DIFFUSION LAYER

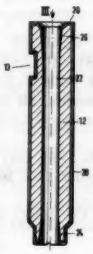
Giuseppe Gigli, Lodi, Italy, assignor to Standardgraph Zeichengerate GmbH, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,966

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 8213929[U]

Int. Cl.³ B43K *1/06*

U.S. Cl. 401—258 **12 Claims**



1. A nib for ink pens, comprising:

an ink tube having opposite upper and lower ends and an inside opening defined therein between the upper and lower ends, the ink tube further having a lower end surface at the lower end for contacting a writing surface; and

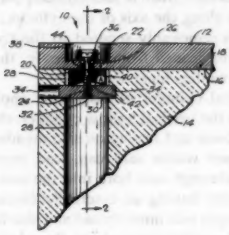
a cleaning wire guidably positioned in the inside opening of the ink tube and having a wire end surface for projecting by a predetermined distance beyond the lower end surface of the ink tube for contacting the writing surface; at least one of the lower end surface of the ink tube and the wire end surface of the cleaning wire comprising a powder-gasphase diffusion layer for hardening the end surface and for providing mechanical resistance.

4,540,304

METAL-TO-CERAMIC ATTACHMENT DEVICE

Edwin A. Pavelka; Quirinus G. Grindstaff, and Stuart E. Scheppele, all of Bartlesville, Okla., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 8, 1983, Ser. No. 473,821
Int. Cl.³ F16B 43/00
U.S. Cl. 403—12 20 Claims



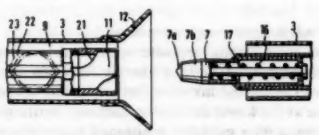
1. A fastening device for securing metal and ceramic elements together, comprising:
- a metal member and a ceramic member having respective confronting surfaces adapted to be clamped together,
- said metal member having a bolt hole therein,
- said ceramic member having an opening therein aligned with said bolt hole,
- a threaded bolt extending through said bolt hole and into said opening,
- a nut spanning said opening,
- said ceramic member having a formation receiving said nut and holding said nut at a predetermined distance from said confronting surfaces,
- said bolt being threadedly received in said nut,
- and a pressure limiting member received in said opening along said bolt and between said nut and said confronting surface on said metal member,
- said pressure limiting member having a limiting dimension limiting the movement of said metal member toward said nut and thereby limiting the pressure applied by said nut to said ceramic member to avoid damage to said ceramic member.

4,540,305

DRIVE SHAFT ASSEMBLY

Hubert Geisthoff; Jürgen Vollmer, both of Lohmar, and Paul Herchenbach, Ruppichteroth, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,575
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1983, 3302976
Int. Cl.³ B25G 3/00
U.S. Cl. 403—13 2 Claims



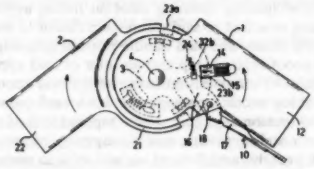
1. A drive shaft assembly for automatically coupling and uncoupling a rotary drive connection between a tractor and an agricultural implement comprising:
- a pair of telescoping drive shaft parts each surrounded by a protective tube which is formed in two parts, one of said drive shaft parts being adapted to fit within the other, each of said drive shaft parts being provided with a profile having a pair of opposed radially extending beads;
- a tapered member on said one drive shaft part extending outwardly therefrom;
- an introducing funnel on said other drive shaft part adapted to have said one drive shaft part inserted therethrough;
- a free-wheeling unit arranged at one end of said drive shaft assembly;
- spring means urging said tapered member outwardly of said one drive shaft part, said tapered member being adapted to be retracted against the force of said spring means;
- an axial cutout formed on said one drive shaft part within the areas between said two beads; and
- a guide piece on said other drive shaft part for guiding said one drive shaft part into engagement therewith, said guide piece having associated therewith an introducing inclination which is directed to extend opposite to the direction of rotation of said drive shaft assembly.

4,540,306

POSITIONING JOINT FOR FOLDING LADDERS

Chien-Yuan Wang, No. 17, Alley 6, Lane 24, Pa Te Rd., Sec. 4, Taipei, Taiwan

Filed Oct. 19, 1983, Ser. No. 543,445
Int. Cl.³ F16C 11/00; E05D 11/10; E06C 7/50
U.S. Cl. 403—93 2 Claims



1. A positioning joint used for folding ladders comprising:
- a first joint member formed with a disk portion composed of a pair of spaced-apart, opposed circular plates from which extends a flat tubular portion having in opposite sides thereof two slots through which is slidably supported a spring-biased pawl operable by an operating lever pivotably connected to said tubular portion and having a release element;
- a second joint member formed with a flat, hollow locking disk from which extends a tubular portion, said locking disk provided with a plurality of peripherally distributed notches engageable with said pawl and a control means for controlling opening and closing of said notches;
- said first and second joint members being pivotably connected together by a common axial bolt passed through the centers of disk portion of the first joint member and the locking disk of the second joint member which is concentrically sandwiched between the plates of said disk portion;
- and characterized in that one side of the hollow locking disk of the second joint member is formed adjacent the respective notches with a corresponding plurality of slots, the length of each slot being at least twice the width of said notches, the other side of said locking disk is formed with a long opening and said control means is pivotably riveted by said axial bolt to one inner surface of one side of the locking disk;

wherein
- said control means is formed with same number of claw arms relative to notches on the locking disk, the free ends of said arms are bent at right angles to the arms to form stop portions which protrude out through the slots of the locking disk; a spring is provided secured one end to a hook portion being formed at the end of the claw projec-

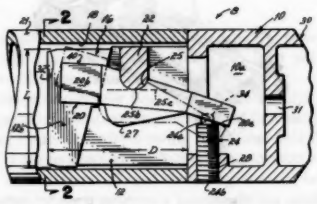
tion which extends out from the control means and the other end to a hook-like projection being provided on the same side of the locking disk where said long opening is formed and into which said projection projects; and said end portions, each protruding through a respective slot of the locking disk, act as an one-way stop means for the release element of the operating lever in disengaging the pawl when said release element is disposed in between the edge leading to said notch and the outer surface of said end portion whereby said pawl is prevented from falling back into the notch.

4,540,307

FITTING FOR STRUCTURAL PIPE

Robert P. Hollaender, II, Cincinnati; Leslie M. Howard, Batavia, both of Ohio, and Ernest A. Hund, Ft. Thomas, Ky., assignors to The Hollaender Manufacturing Co., Cincinnati, Ohio

Filed Jun. 1, 1984, Ser. No. 616,270
Int. Cl.³ F16B 7/00
U.S. Cl. 403—190 **12 Claims**



1. A fitting comprising:
a body;
a pair of generally parallel, spaced arms extending from said body;
a pair of confronting camming surfaces, each said arm including a respective one of said camming surfaces thereon;
a locking element located between said arms and mounted for pivotal motion about an axis perpendicular to said arms; and
actuator means accessible exteriorly of said body for selectively pivoting said locking element to a position between said arms for engagement with said confronting camming surfaces thereof to urge said arms outwardly for interiorly gripping a hollow pipe into which said arms have been inserted.

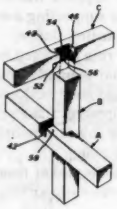
4,540,308

JOINT FOR FURNITURE SUPPORT STRUCTURE

Edward Colby, 214 St. Sacrement St., Montreal, Quebec, Canada H2Y 1W8

Filed Dec. 27, 1983, Ser. No. 565,373
Int. Cl.³ F16B 7/18
U.S. Cl. 403—219 **7 Claims**

1. A joint for use in furniture support structure comprising:
three serially-interconnectable members including a first member and a second member initially-interfittable and an interlocking third member connectable to said first and second members interfitted; each member including a cut-away section; each cut-away section of said first and second members defining a cavity defining an L-shaped volume; said first and second members, in interfit relation, defining a cavity having a rectangular volume; the cut-away section of said third member defining a cavity having a volume including said L-shaped volume and said rectangular volume.

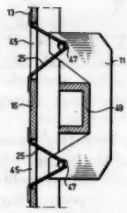


4,540,309

ATTACHMENT DEVICE

Erik G. Hansson, Stughemmet, S-562 42 Sandhem, Sweden

Filed Jul. 18, 1983, Ser. No. 514,955
Claims priority, application Sweden, Jul. 20, 1982, 8204399
Int. Cl.³ F16B 2/14
U.S. Cl. 403—374 **20 Claims**



1. A combination comprising:
a plate having an elongated edge, and means defining an opening adjacent said edge;
a profiled strip having a curved center portion, slot means formed in said center portion for receipt of said plate edge therein, and two end portions; said slot means elongated in a dimension extending toward said end portions;
rail means for receiving said end portions of said profiled strip, and holding both end portions of said profiled strip in contact therewith;
conical screw means for insertion through said plate opening for engaging said strip center portion and said means defining said plate opening to effect holding of said plate to said rail in a readily detachable manner, said conical screw means having portions thereof having a diameter substantially less than the minimum cross-sectional dimensions of said opening.

4,540,310

MANHOLE RISER AND COOPERATING SLEEVE TO PROVIDE A WATERLOCK FOR MANHOLE STRUCTURES

Jack Ditcher, Langhorne, and Eric A. Ditcher, Cornwells Heights, both of Pa., assignors to A-Lok Products, Inc., Tullytown, Pa.

Filed Jul. 18, 1983, Ser. No. 514,584
Int. Cl.³ E21D 29/14
U.S. Cl. 404—25 **15 Claims**

1. Apparatus for providing a water-tight seal in the region above the riser section of a manhole structure comprising:
plastic sleeve means having an integral flange centrally located upon the top of said riser section, said flange

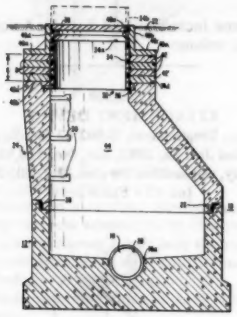
extending over at least a portion of the top surface of the riser section, the outer diameter of the riser section being greater than the outer diameter of the flange;

a manhole cover support frame with an integral annular upper flange for supporting a manhole cover and an integral lower supporting flange;

at least one grade ring arranged between the lower supporting flange of said manhole cover support frame and the top surface of said riser section and extending over the top surface of said integral flange of said sleeve means;

said support frame lower supporting flange being arranged upon said grade ring;

resilient compressible gasket means arranged between said support frame lower supporting flange and the top surface



of said riser section, for providing a water-tight seal therebetween;

said sleeve means extending upwardly from said integral flange to extend above said riser section, through said grade ring and into said manhole cover support frame and above the lower supporting flange and adjacent to and below said upper flange to prevent subsurface water, which may seep into the region between said frame and riser section, from entering into the interior of said manhole structure;

the sleeve means having a diameter sufficient to permit ingress into and egress from the manhole structure by a person without moving the sleeve means;

said sleeve means being formed of a plastic material.

4,540,311

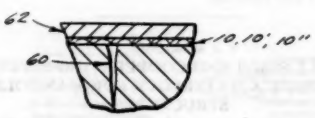
GEOTEXTILE FABRIC CONSTRUCTION

Jack Leach, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Division of Ser. No. 238,660, Feb. 26, 1981, Pat. No. 4,472,086. This application Nov. 30, 1981, Ser. No. 325,914

Int. Cl.[3] E01C *3/06, 7/28*

U.S. Cl. 404—72 **4 Claims**



1. A method for repairing surfaces having cracks contained therein comprising:

(a) placing a layer of geotextile fabric on a cracked surface which is to be repaired, said geotextile having an extensibility no greater than the extensibility of a layer of asphalt to be placed on top of the layer of geotextile fabric; and

(b) saturating the layer of geotextile fabric with an asphalt binder; and

(c) placing a layer of asphalt on top of said geotextile fabric.

4,540,312

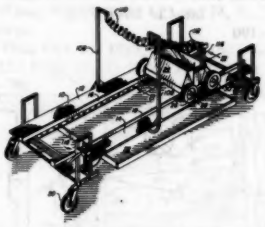
MATERIAL SPREADER SYSTEM WITH COLUMN BYPASS

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Continuation-in-part of Ser. No. 170,126, Jul. 18, 1981, Pat. No. 4,349,294, which is a continuation-in-part of Ser. No. 101,545, Dec. 10, 1979, abandoned. This application Oct. 15, 1981, Ser. No. 311,674

Int. Cl.[3] E01C *19/18*

U.S. Cl. 404—110 **47 Claims**



1. A system for dispensing a topping material onto the surface of a plastic substance lying within an area having a length, width and opposing sides, said area including a vertically extending obstruction positioned adjacent one of the sides of said area, extending a predetermined distance into said area and defining a reduced width section of said area, said system comprising:

a. a spreader for storing a supply of topping material and for dispensing a layer of the topping material as said spreader is translated along a path;

b. adjustable bridge means having first and second ends for providing an elevated path to permit widthwise translation of said spreader across said area, the span of said bridge means having a length equal to or greater than the width of said area when said bridge means is in an extended position, said bridge means including means for reducing the span length such that the first end of said bridge means clears said obstruction;

c. translatable bridge support means coupled to said bridge means for supporting said bridge means above said area and permitting translation of said bridge means along the entire length of said area, including

(i) first means for supporting said bridge means as said bridge means is translated along the full width section of said area;

ii. second means for supporting thefirst end of said bridge means as said bridge means is translated along the reduced width section of said area; and

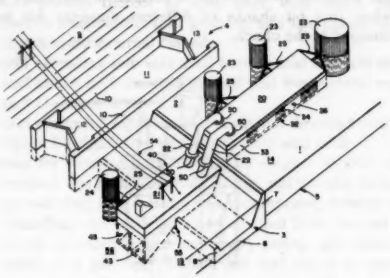
d. drive means coupled to said spreader for translating said spreader across the path formed by said bridge means to thereby dispense a uniform layer of topping material over said area, whereby sequential translations of said spreader across said bridge means followed by sequential translations of said bridge means along the length of said area in displacements related to the width of the layer of topping material dispensed by said speader covers the entire surface of said area with a uniform layer of topping material.

4,540,313

APPARATUS FOR THE GENERATION OF HYDROELECTRIC POWER AND METHOD OF MANUFACTURING AND INSTALLING SAME

Kenneth R. Broome, Reading, Pa., assignor to Williams and Broome, Inc., Exton, Pa.

Filed Apr. 6, 1984, Ser. No. 597,465
Int. Cl.[3] E02B 9/00
U.S. Cl. 405—78 38 Claims



1. An apparatus for generating hydroelectric power in association with damming means spanning at least portions of a fluid flow, said apparatus comprising:

a first barge adapted for floating and located adjacent to and upstream of said damming means, said first barge incorporating means for withdrawing fluid from said fluid flow;

a second barge adapted for floating and located adjacent to and downstream of said damming means, said second barge incorporating means for generating said power in response to a received water flow and head; and

penstock means having respective ends attached to and extending between portions of the first barge and portions of the second barge so that said first barge is placed in fluid communication with said second barge, and so that fluid withdrawn from said first barge is capable of being delivered over the damming means to the second barge to develop said water flow and head.

4,540,314

TENSION LEG MEANS AND METHOD OF INSTALLING SAME FOR A MARINE PLATFORM

Chester B. Falkner, Jr., Huntington Beach, Calif., assignor to Fluor Subsea Services, Inc., Irvine, Calif.

Continuation of Ser. No. 361,786, Mar. 25, 1982, abandoned. This application Dec. 21, 1984, Ser. No. 684,166
Int. Cl.[3] B63B 35/44; E02B 17/00
U.S. Cl. 405—227 40 Claims

1. In a tension leg for a marine platform having a hawse pipe, and an anchor pile number fixed in a seabed, the combination of:

a comprising tension pipe string comprising plurality of pipe string members;

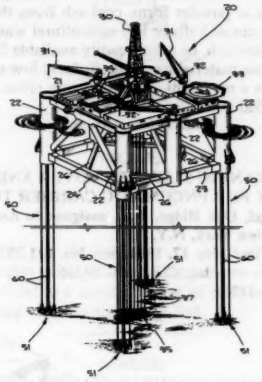
couplings interconnecting said pipe string members; connector means on said anchor pile member and on the lower end of the lowermost pipe member,

said connector means including lock means against relative rotation;

said pipe string extending into said hawse pipe;

latch connector means at the upper end of the uppermost pipe member and on said platform for connecting the upper end of said tension pipe string to said platform,

said latch means including fluid pressure means for adjusting tension in said tension pipe string and for exerting a gripping force on said upper end of the uppermost pipe member.



4,540,315

METHOD FOR EXPLORATORY TRENCH WALL STABILIZATION

Glenn R. Roquemore, Ridgecrest; Patrick E. Smith, Fresno, both of Calif., and Eric W. Banks, Salt Lake City, Utah, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1983, Ser. No. 470,738
Int. Cl.[3] E02D 3/12; C09K 17/00
U.S. Cl. 405—264 3 Claims

1. A method of stabilizing unconsolidated sand and gravel in a geologic exploratory trench wall comprising the step of:

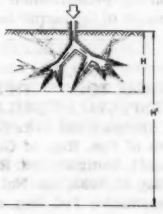
spraying a vinyl acetate-ethylene copolymer emulsion to the trench wall surface to form a cohesive clear emulsion-sand crust, so as to allow for visual observation of the underlying trench wall.

4,540,316

COMPOSITION FOR IMPROVING STRENGTH OF SOFT GROUND CONTAINING ORGANIC MATTER, AND METHOD OF IMPROVING STRENGTH OF SOFT GROUND BY UTILIZING SAID COMPOSITION

Yuichiro Takahashi, 1-2-6, Bandai, Niigata, Japan

Filed Mar. 19, 1982, Ser. No. 359,906
Claims priority, application Japan, Mar. 19, 1981, 56-40154
Int. Cl.[3] C09K 17/00; E02D 3/12
U.S. Cl. 405—264 4 Claims



1. A composition for consolidation injection thereby to form cracks in the ground and to improve the structural strength of soft ground containing organic matter, said composition hav-

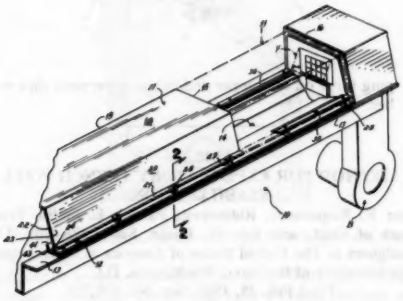
ing improvement in combination therewith comprising: cement, bentonite, water, and a substance A in the proportions 1.0:0.1–2.0:1.0–3.5:0.5–2.0, respectively, said substance A being one or more of volcanic ash, wood waste in powder form, waste plastics in powder form, coal ash from thermoelectric power plants, cereal hulls or like agricultural waste in powder form, incinerator ash, or other readily available finely divided natural or waste material having a similarly low specific gravity resulting in a minimum of solidification rather than a completely solidified and substituted mass.

4,540,317

SELF-CLEANING SLIDABLE COVER AND TRACK ASSEMBLY FOR PNEUMATIC CARRIER TERMINAL

Victor J. Vogel, Oak Ridge, N.J., assignor to American Standard Inc., New York, N.Y.

Filed May 17, 1984, Ser. No. 611,332
Int. Cl.³ B65G *51/26*
U.S. Cl. 406—112 **6 Claims**



1. In a pneumatic carrier system for drive-up banking and the like, the system including a conduit interconnecting teller and customer terminals for pneumatically transporting a carrier through the conduit in either direction between the terminals, and blower means for moving the carrier, the improvement in a self-cleaning cover and track assembly comprising:

a terminal cover having an interior and an exterior, the cover being axially traversed along a track on the terminal to open and close a terminal;

means for providing an airflow path for the outflow of air from the terminal between said cover and said track when the terminal is pressurized by air from the blower means; and

valve means extending along said airflow path and interior to said cover for sealing said airflow path, said valve means movable by the outflowing pressurized air from a first position wherein said airflow path is open permitting the outflowing pressurized air to blow debris from said track, to a second position wherein said airflow path is blocked, permitting pressurization of the terminal for pneumatic transport of the carrier from the terminal.

4,540,318

ROTARY ELECTRICAL TOOL WITH SPEED CONTROL, ESPECIALLY DRILL

Friedrich Hornung, Stuttgart, and Fritz Schädlich, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch, GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1983, Ser. No. 497,506
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228304; Jul. 29, 1982, 3228303
Int. Cl.³ B23B *45/02*
U.S. Cl. 408—9 **37 Claims**

1. Electrical rotary cutting machine having a tool housing (H);

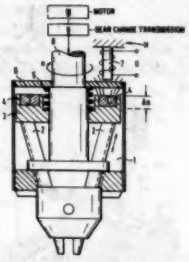
an electric drive motor (M, 61);

a motor controller (30);

a tool bit chuck (1, 1') to receive a shank of a tool bit, and having chuck jaws (2, 2') which can be tightened around the shank of the tool bit,

and comprising, in accordance with the invention,

a transducer (4,7) having a first part (4), rotating with and coupled to the jaws (2, 2') of the chuck (1, 1'), but electrically and mechanically unconnected with said housing, and movable upon change in position of the chuck jaws when tool bit shanks of different diameter are being clamped in the chuck,



and a second part (7) secured to the housing (H),

movement of the jaws resulting in relative shifting of position of the first part of the transducer with respect to the second part;

means (3, 5) for moving said first part (4) within said chuck in accordance with movement of said chuck jaws;

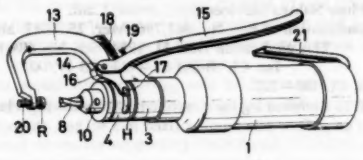
and means (34, 35; 84, 85) electrically coupled to said second part (7) for delivering to said motor controller (30) a signal whose amplitude is representative of the spacing of said first and second parts and whose frequency is representative of the rotation speed of said chuck with respect to said housing.

4,540,319

DRILLING DEVICE FOR REMOVING A SPOT-WELDED PORTION

Tsukai Michiharu, 52, Kasugacho 6-chome, Fukuyama-shi, Hiroshima-ken, Japan, assignor to Michiharu Tsukai, Hiroshima and Maeda Kiko Company Limited, Osaka, both of, Japan

Filed Aug. 27, 1982, Ser. No. 412,971
Int. Cl.³ B23B *45/14*
U.S. Cl. 408—100 **4 Claims**



1. A drilling device for removing a spot-welded portion, said device comprising:

a main body casing having a forward end;

a chuck receiving holder fixed rigidly to said forward end of said main body casing;

a U-shaped arm having a first end fixed to a side portion of said chuck receiving holder, a base shoulder portion adjacent said first end, and a free second end spaced forwardly of said forward end of said main body casing;

a chuck receiver extending into said forward end of said main body casing and axially slidable with respect thereto, said chuck receiver having extending therefrom a flange for abutment with said chuck receiving holder, thereby to restrict axial movement of said chuck receiver into said main body casing, said chuck receiver having formed therein an engaging groove;

a chuck received within said chuck receiver and axially slidable therewith, said chuck having formed in a forward end portion thereof an axial bore, said chuck having therein longitudinal split grooves, and said chuck having therearound external threads;

a drill extending into said axial bore in said forward end of said chuck and directed toward said free second end of said U-shaped arm;

socket means having internal threads and threaded over said chuck for tightening said chuck onto said drill;

means for rotating said chuck with respect to said chuck receiver and said main body casing, and thereby for rotating said drill, said rotating means comprising a rotary shaft extending into said chuck and adapted to be rotated by a motor mounted in said main body casing, and means for connecting said rotary shaft and said chuck to prevent relative rotation therebetween while enabling relative axial movement therebetween;

first bearing means between said main body casing and said rotating means to enable relative rotation therebetween;

second bearing means between said chuck and said chuck receiver to enable relative rotation therebetween;

means for moving said chuck receiver, said chuck and said drill axially of said main body casing toward said free second end of said U-shaped arm, said moving means comprising a grip handle pivotally mounted on said base shoulder portion for movement between a first position relatively spaced from said main body casing and a second position relatively toward said main body casing, and a chuck thrusting arm integrally connected to said grip handle and having a pin fitting in said engaging groove and thereby engaging said chuck receiver such that, upon movement of said grip handle from said first position thereof toward said second position thereof, said chuck thrusting arm moves said chuck receiver, and thereby said chuck and said drill, axially with respect to said main body casing and said rotating means toward said free second end of said U-shaped arm;

means for adjustably restricting the length of said axial movement, said restricting means comprising a screw mounted on said grip handle and having an end abutting a surface of said base shoulder portion when said grip handle is in said second position thereof, said screw being mounted to adjust the relative position of said abutting end with respect to said base shoulder portion; and

means on said main body casing for operating the motor for rotating said rotary shaft, and a lever pivotally mounted on said main body casing for movement between a first position spaced from said operating means and a second position actuating said operating means, said lever being positioned such that movement of said grip handle to said second position thereof moves said lever to said second position thereof, thereby rotating said rotary shaft.

4,540,320

SELF GENERATING PROFILE GENERATOR

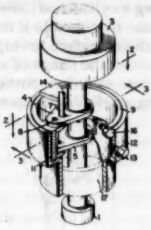
Eugene E. Arnold, Puyallap, Wash., assignor to Flow Systems, Inc., Kent, Wash.

Filed Aug. 8, 1983, Ser. No. 521,034
Int. Cl.³ B23C *1/20*; B23B *41/00*; B26D *5/08*
U.S. Cl. 409—232 **8 Claims**

1. An apparatus for cutting a hole comprising

a housing; and,

a ring rotatably mounted in said housing, and



a link pivotably mounted to said ring at one end and rotatably mounted to a cutting tool at its other end, and

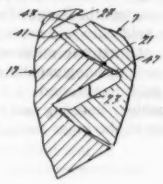
means for applying torque to said link.

4,540,321

ANTI-VIBRATION THREAD FORM

Imre Berecz, Dana Point, Calif., assignor to Microdot Inc., Darien, Conn.

Continuation of Ser. No. 961,394, Nov. 16, 1978, abandoned. This application Sep. 18, 1980, Ser. No. 188,503
Int. Cl.³ F16B *39/30*
U.S. Cl. 411—310 **1 Claim**



1. A vibration resistant fastener assembly comprising a nut body having an aperture provided with a helical internal thread, and a member having a substantially V-shaped symmetrical external helical thread with a standard leading and following flank angle of sixty degrees relative to the central axis of said member and adapted to mate with said helical internal thread, the internal thread in said nut body having a thread form comprising a leading flank and a following flank, said following flank having a concave surface such that all tangents thereto extend at an angle less than sixty degrees relative to the central axis thereof and less than the flank angle of the following flank of the external thread on said member whereby the radially outermost portion of said external thread is initially engageable with the concave flank of said internal thread.

4,540,322

SECURITY DEVICE

Bob J. Coffia, Oklahoma City, Okla., assignor to Grace Petroleum Corporation, Oklahoma City, Okla.

Filed Jan. 13, 1983, Ser. No. 457,768
Int. Cl.³ F16B *41/00*
U.S. Cl. 411—338 **36 Claims**

1. A security device comprising:

(a) a stem portion having threads at one end and a flange adjacent the other end;

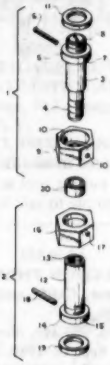
(b) a stem receiving portion having a cavity in one end and a flange adjacent the other end, said cavity having threads adapted to receive and engage the threads of said stem portion;

(c) the flange on said stem portion and on said receptacle

portion each having a channel at least partially therethrough;

(d) a false nut having a cylindrical inner surface and a multi-sided outer surface to resemble a conventional nut, one end of said cylindrical surface having a decreased diameter adapted to contact the flange of said stem portion and thereby be held onto said stem portion;

(e) a false nut having a cylindrical inner surface and a multi-



sided outer surface to resemble a conventional nut, one end adapted to contact the flange of said receiving portion and thereby be held onto said receiving portion;

(f) an opening in at least one multi-sided outer surface of each false nut, each opening capable of being aligned with the channel in each flange; and

(g) pin means capable of entering said channel in said flange and the opening in the outer multi-sided surface of said false nut.

4,540,323

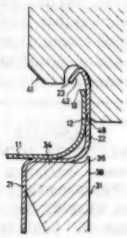
METAL CONTAINERS AND THEIR MANUFACTURING METHOD AND APPARATUS

Makoto Inoue; Hirofumi Irie; Youichi Kobayashi, and Tetuo Kubota, all of Tokyo, Japan, assignors to Nittetsu Steel Drum Co., Ltd., Tokyo, Japan

Division of Ser. No. 344,076, Jan. 28, 1982, abandoned, which is a continuation-in-part of Ser. No. 264,768, May 18, 1981, abandoned. This application Mar. 20, 1984, Ser. No. 591,527

Int. Cl.[3] **B21D** *39/00*

U.S. Cl. 413—6 **4 Claims**



1. In a method of manufacturing a metal container which includes the steps of fitting a tray-like end plate into an end of a cylindrical body so that a body flange formed by bending the edge of the body outwardly perpendicular to the body axis overlaps an end plate flange formed by bending the edge of the end plate outwardly so as to extend along and beyond the body flange, fitting a seaming chuck having a cylindrical forming face into the indented part of the end plate and abutting the cylindrical portions of the end plate and body from which said flanges extend against said seaming chuck, and pressing a seaming roll and a nip bending and press forming roll radially inwardly against said flanges, each roll having a circumferential forming groove opening toward the forming face of the seaming chuck, while rotating the forming face of the seaming chuck so that the forming grooves seam the body and end plate flange into a seven-fold seam, the improvement comprising the steps of:

providing a nip bending recess in the corner of the cross-sectional profile of the forming groove in the nip bending and press forming roll which is toward the end of the container with said flanges thereon at the start of the action of said nip bending and press forming roll;

pressing said nip bending and press forming roll radially inwardly as a first seam forming step and bringing said nip bending recess into contact with said end plate flange for nip-bending the radially outer edge of said end plate flange;

then pressing said seaming roll inwardly for seaming the body and end plate flanges together with the forming groove of the seaming roll to form a rolled seam; and then, after completion of the pressing of said seaming roll,

finishing press forming the seam into a desired shape by further pressing said nip bending and press forming roll inwardly for forcing the forming groove of said nip bending and press forming roll against the thus rolled seam for forcing the top radially outer portion of the seam into said recess and pressing the remainder of the seam into a flattened shape and pressing the parts of the flanges tightly together for forming a seam having, as a whole, a generally elongated rectangular shape when viewed in cross-section with at least the top portion of the radially outermost surface arching convexly outwardly and a middle portion thereof extending generally parallel to the axis of the container.

4,540,324

DEVICE FOR DETECTING WHETHER OR NOT ONE END OF A BELT-SHAPED SHEET IS LOCKED

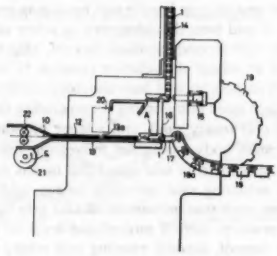
Mikio Kogane, and Seiichi Yamazaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 17, 1983, Ser. No. 467,549

Claims priority, application Japan, Feb. 18, 1982, 57-21833[U]

Int. Cl.[3] **B65H** *7/02*

U.S. Cl. 414—20 **9 Claims**



1. A device for detecting whether or not an end of a sheet is locked for conveyance comprising:

means for engaging and locking said end of said sheet to convey it from one position to another under tension;

reciprocating means moving orthogonal to said sheet for depressing one end of said sheet in a direction generally perpendicular the surface of said sheet when said sheet is moved into a locking position; and

detector means responsive to movement of said reciprocat-

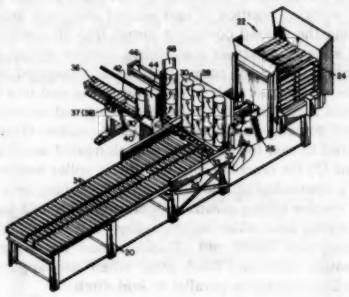
ing means for depressing to produce an output signal representative of whether said sheet is engaged and locked to said engaging means.

4,540,325

UPSTACKER APPARATUS WITH BIASED GRIPPING MEANS

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417

Filed Apr. 18, 1983, Ser. No. 485,743
Int. Cl.³ B65G *57/30*
U.S. Cl. 414—96 **27 Claims**



23. An upstacker jaw clamp in which containers of like or similar size and configuration are fed one at a time to an upstacker station and to and on an elevating platform which receives and lifts said containers to an elevated condition whereat the container is retained by opposed reciprocated jaw clamps moved simultaneously or nearly simultaneously into a retaining condition in response to signals from a logic and timing control circuit, this upstacker and clamp jaws are actuated to deliver said containers to a palletizing apparatus including a pallet moved from a storage means and, one at a time, presented in way of a loading station, said containers moved by cylinder means in response to signal actuation provided by said logic and timing control circuit, this apparatus and clamp jaw including:

(a) means for advancing a like container to the upstacking station in response to a timing signal means from said control circuit and at said upstacking station actuating an elevating platform which receives and elevates this container to a position from which said containers are moved;

(b) a pair of jaw clamps in which each clamp has a reciprocable block that includes a supporting lip portion disposed toward the container and disposed towards each other and in the same plane and when the jaw clamp blocks are moved toward each other the lip portions thereof are movable under the lower rim of the just elevated container to support said container when brought to its upper limit by said elevating platform;

(c) means for moving the clamp blocks in a reciprocated manner and in a timed relationship with the elevated motion of the upstacker elevating platform, the upward motion concluding with an extreme upward limit of said platform;

(d) a pair of pins carried in each of said clamp blocks, said pins disposed and reciprocable in substantially parallel bores in said block with each pin having means for limiting the forward movement of the pin, each pin having a blunted end and with the axis of said pins disposed substantially equidistant from a theoretical line that passes through the center of the blocks and the center of the container, each pin urged forwardly towards the container by bias means, the pair of pins in each block adapted to extend forwardly of the supporting lip when a container is not supported by this lip, the pins extending toward each other and toward the sidewall of the container with the bias force urging a pin forwardly causing the blunt ends of the pins to engage the sidewalls of said container when the jaw block is moved into close proximity of said container, these pins when moved into engagement with the sidewalls of the container providing a centering action particularly during the withdrawal of the lip of the jaw clamp away from supporting condition of the container and further withdrawal of the jaw clamp block and these reciprocable pins carried therein and extending from said block being sufficiently moved away from the container so as to enable a below container to be elevated to a supporting condition whereat the jaw clamp block, pins and said lip portion are brought to a supporting position at and below the end of the just elevated below container;

(e) fixed means for supporting the jaw clamps so as to be reciprocated toward and from a container;

(f) means for repeating the upstacking sequence of the containers until the desired number of containers is accumulated in a substantially vertically stacked array;

(g) plate member means for moving the accumulated stack of containers from the upstacking station to and onto a dead plate and repeating this operation by and with a timed control until a predetermined number of stacks of containers are positioned side by side on said dead plate;

(h) means for moving a row of containers from said dead plate onto a pallet positioned below the dead plate, and

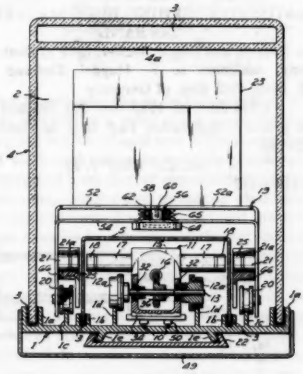
(i) switch means actuated by the plate member used for moving the stack of containers from the upstacker station to the dead plate and carried by this plate member is a cam member adapted to engage two additional switch means which additional switch means are controlled to provide long and shorter strokes, said switch means sending counting signals to means which establish the number of containers in a stack and number of stacks on a dead plate, the stroke lengths being alternated between rows of containers to provide intermeshing when the containers are cylindrical or nearly cylindrical.

4,540,326

SEMICONDUCTOR WAFER TRANSPORT SYSTEM

Peter R. Southworth, Mission Viejo, and Gregory R. Baxter, Orange, both of Calif., assignors to Nacom Industries, Inc., Tustin, Calif.

Filed Sep. 17, 1982, Ser. No. 419,201
Int. Cl.³ B65G *35/00*
U.S. Cl. 414—217 **13 Claims**



1. A wafer transport system for minimizing the danger of contamination to the wafers being carried by the system comprising:

an elongated, track-like support having a pair of inner tracks on the upper side of the support

means on said support located between said inner tracks for conducting electrical power

a driver cart riding on said inner tracks

an electric motor included with the driver cart

an electrical power pick-up on the cart for transferring electricity from the power conducting means to the electric motor

a generally U-shaped inner cover supported in an inverted orientation on said track-like support to form, with the support, an inner tunnel through which said driver cart can travel, said support having means spaced outwardly from said inner tracks to sealingly cooperate with the lower edges of the side legs of said cover

a pair of outer tracks on said support including a track on each side spaced outwardly from but in close proximity to means on the support for receiving the lower legs of said cover

a driven cart having a generally U-shaped support structure positioned in an inverted orientation with an upper support surface and depending side legs, and having wheels rotatably mounted on the lower ends of said structure side legs, the driven cart wheels being aligned to ride on said outer tracks, with the side legs of the driven cart structure being spaced outwardly from the side legs of the inner cover to straddle and enclose the inner cover and the driver cart, said driver cart including an upper support surface spaced above and extending over the upper wall of the inner cover, said upper support surface being adapted to support a wafer carrier on said surface, remote from the wheels on said driven cart

magnetic means on said driver cart extending outwardly in close proximity to the inner surface of said inner cover, and magnetic means on said driven cart structure and extending closely adjacent to the outer surface of said inner cover and aligned with the magnetic means on said driven cart so that sufficient magnetic force can be exerted by the magnetic means on the driver cart to cause the driven cart to follow the motion of the driver cart and

an outer generally U-shaped cover arranged in an inverted orientation fitting over the driven cart and the space to be occupied by a wafer carrier on top of the driven cart so that the outer cover in combination with the inner cover and said support forms an outer tunnel through which said driven cart can travel, said support being formed with means on its upper surface spaced outwardly from said outer tracks for sealingly cooperating with the lower ends of the side legs of the outer cover.

4,540,327

APPARATUS FOR FEEDING BULK MATERIAL, SUCH AS SAND

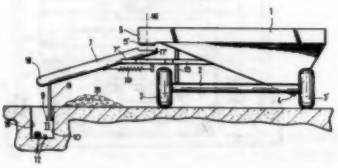
Friedrich Happel, and Günter Heller, both of Baal, Fed. Rep. of Germany, assignors to F. Happel Tief-und Strassenbau GmbH, Baal, Fed. Rep. of Germany

Filed Jun. 20, 1983, Ser. No. 505,684

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224765

Int. Cl.³ B60P *1/42*

U.S. Cl. 414—352 **6 Claims**



1. An apparatus for feeding bulk material into a ditch comprising carriage means (**2, 3**) continuously movable in a travel direction along the ditch, funnel shaped container means (**1**) operatively supported by said carriage means for holding a supply of bulk material, said container means having a discharge member (**5**) at an upper edge of said container means, first feed conveyor means (**6**) operatively mounted in said funnel shaped container means for transporting bulk material from the bottom of the container means to said discharge member, elongated second conveyor means (**7**) having an upper end and a lower end, journal means for hinging said second conveyor means (**7**) about a vertical axis so that said second conveyor means receive at said upper end of the second conveyor means bulk material from said first feed conveyor means when the second conveyor means is in a working position extending normally substantially at a right angle to said travel direction for discharging bulk material into the ditch in said working position of said second conveyor means and for folding the second conveyor means into an inactive position, said apparatus further comprising tension spring means (**19**) connected with one spring end to said elongated second conveyor means and with its opposite spring end to a fixed point on said apparatus for urging said elongated second conveyor means toward said apparatus, guide means (**8**) operatively secured to said lower end of said elongated second conveyor means (**7**) for reaching into said ditch, roller means (**9**) operatively connected to said guide means reaching into said ditch, said tension spring means cooperating with said guide means for urging said roller means against a wall of said ditch for keeping said lower end of said second conveyor means in alignment with said ditch even when said apparatus is not travelling exactly in parallel to said ditch.

4,540,328

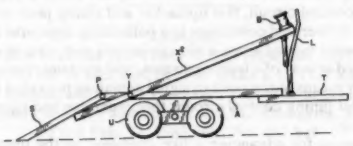
LOGGING TRAILER

Charles E. McManama, 27484 SE. Paul Bunyan La., Eagle Creek, Oreg. 97022

Filed Nov. 26, 1982, Ser. No. 444,813

Int. Cl.³ B60P *1/00*

U.S. Cl. 414—538 **4 Claims**



1. A load handling transport vehicle comprising a wheel support load platform, a loading ramp hinged to the rear end of said platform, a rectangular frame straddling said platform and pivoted to said platform at the sides thereof, said frame having a front and rear crossmember with the rear crossmember being under said ramp and engageable therewith, whereby upon pivoting of said frame said ramp is pivoted between a ground engaging and load transporting position.

4,540,329

SAFETY LOCK FOR TAILGATE LIFT

Paul Martin, Toronto, Canada, assignor to Diesel Equipment Limited, Toronto, Canada

Filed Mar. 28, 1983, Ser. No. 479,157

Int. Cl.³ B60P *1/46*

U.S. Cl. 414—545 **4 Claims**

1. In a power operated hoist having a frame, a load support mounted on first and second longitudinally elongated slide members arranged one at either side of the load support and extending upwardly therefrom, a hoist mechanism including first and second flexible power transmission members drivingly connected to said first and second slide members respectively for suspending the slide members and load support from the hoist mechanism and for raising and lowering the slide members and load support in response to operation thereof, said

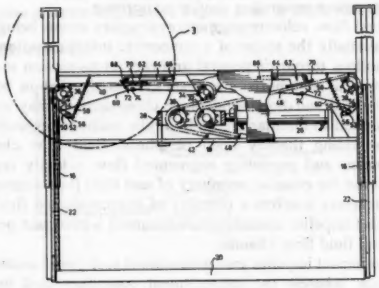
flexible power transmission members being subjected to a normal tensioning load when supporting, raising and lowering said slide members, the improvement of;

(a) first and second latch arms pivotally mounted adjacent said first and second slide members respectively, said first and second latch arms each being movable between the latching position engaging and locking their associated slide to prevent lowering thereof and a released position out of locking engagement with its associated slide, and

(b) latch actuating means for moving said latch arms between said latching position and said release position, said latch actuating means comprising;

(i) means normally urging said latch arms to said latching position,

(ii) first and second tension detector levers pivotally mounted on said frame for movement between a raised position and a lowered position, each of said first and second tension detector levers having a free end engaging said first and second flexiblepower transmission members



respectively so as to be retained in said raised position when their associated flexible power transmission member is subjected to a normal tensioning load and lowered to said lowered position when the tension in their associated flexible power transmission members drops below a predetermined amount,

(iii) a flexible connector connecting said first and second latch means, said flexible connector engaging said first and second tension detector levers so as to be retained by said first and second tension detector levers in a position retaining said first and second latch arms in their release position when a normal tensioning load is detected in said first and second power transmission members respectively, said flexible connector being slackened when either one of said first or second tension detector levers moves away from its raised position so as to cause movement of said first and second latching arms to their latching position when said detector levers detect the absence of a normal tensioning load in said first or second power transmission members respectively.

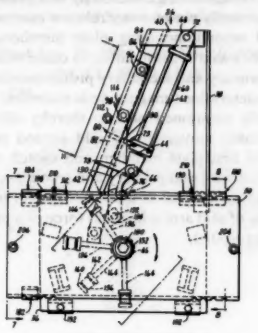
4,540,330

LOAD ROTATING ATTACHMENT FOR LIFT TRUCKS

William L. Taylor, Jackson, Mich., assignor to The Knickerbocker Company, Jackson, Mich.

Filed Mar. 16, 1984, Ser. No. 590,282
Int. Cl.³ B65F 9/14
U.S. Cl. 414—641 **19 Claims**

14. A load rotating mechanism comprising a support having pivot mounting means thereon, a member rotatably mounted on said support pivot means and adapted to support a load carrier for bodily rotation thereof with said rotatable member about the rotational axis of said pivot means, and rotating mechanism including power drive means operably coupled between said support and said rotatable member for rotating the latter, said rotating mechanism including drive means movable by said power drive means along a travel path trangential to said axis and laterally offset therefrom, and a drive link pivotally coupled between and to said movable drive



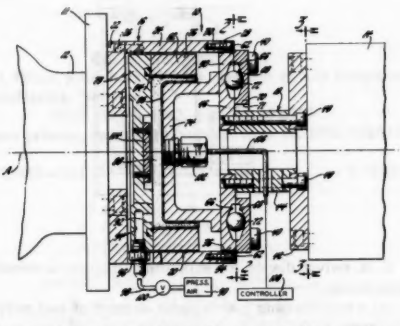
means and to said rotatable member for bodily travel and pivotal motion in a path extending partially around and radially offset from said pivot mounting means.

4,540,331

CUT OUT DEVICE

Donald Stanner, Milford, Mich., and Walton Hughes, Hendersonville, N.C., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 18, 1983, Ser. No. 524,424
Int. Cl.³ B25J 9/00
U.S. Cl. 414—730 **2 Claims**



2. A cut out device adapted to be connected to and interposed between the arm of a robot and a supported work tool for preventing movement of said arm when a collision occurs between said work tool and an improperly positioned part or said arm is restrained from further movement of said part, said cut out device comprising a first mounting plate member secured to said arm and formed with an enclosed space, a second mounting plate member having one end thereof secured to said work tool and having the other end rigidly connected to a cross member, a spring mechanism including primary and secondary piston members interconnected by a diaphragm to form a pressurized chamber located in said enclosed space and interposed between said first mounting plate member and said second mounting plate member, a ring member carried by said second plate member, said ring member and said cross member each having a plurality of circumferentially spaced conical cavities formed therein opposite each other, a ball located in each pair of opposed conical cavities, means connecting said ring member to said secondary piston member whereby said

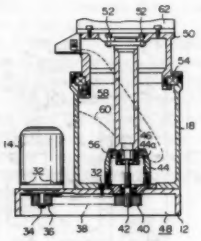
cross member of said second plate member and said ball in each of said pair of opposed conical cavities are held between said primary piston member and said ring member by a force of a predetermined magnitude generated by said pressurized chamber so as to normally prevent any relative movement between said first and second mounting plate members, said means cooperating with said cross member to cause relatively movement of said primary and secondary piston members when said force of a predetermined magnitude is exceeded as a result of said improperly positioned part to thereby allow torsional, axial or pivotable movement of said second plate member relative to said first plate member, and switch means operatively associated with said primary and secondary piston members for providing a signal to a control system to disable further movement of said arm when said force of a predetermined magnitude is exceeded.

4,540,332

SWIVEL DEVICE

Seiichiro Nakashima; Hajimu Inaba, both of Hino, and Shigemi Inagaki, Kokubunji, all of Japan, assignors to Fanuc Ltd., Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 486,083
Claims priority, application Japan, Apr. 21, 1982, 57-65409
Int. Cl.³ B25J *9/00*
U.S. Cl. 414—744 R **6 Claims**



1. A swivel device for supporting thereon a swivel unit, comprising:

(a) a base forming a lowermost element of said swivel device;

(b) a hollow frame means fastened onto said base and defining therein a generally vertically extended space;

(c) an upright shaft of substantially small diameter relative to the diameter of said hollow frame rotatably supported in substantially the center of said space of said hollow frame means, said upright shaft having an upper end thereof connectible to said swivel unit;

(d) a drive means connected to a lower end of said upright shaft for rotation, said drive means comprising a driving motor disposed on said base and outside said hollow frame means and a transmission mechanism arranged between said driving motor and said lower end of said upright shaft, and a reduction gear connected to said lower end of said upright shaft; and

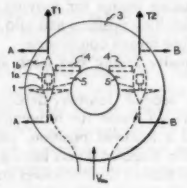
(e) cable and conduit means accommodated in said vertically extended space of said hollow frame means and circumferentially disposed around said upright shaft for controlling said swivel unit.

4,540,333

TARP ROTOR SYSTEM THRUST, YAW AND LOAD CONTROL

Alfred L. Weisbrich, 3 Lenora Dr., West Simsbury, Conn. 06092

Continuation-in-part of Ser. No. 273,006, Jun. 12, 1981, Pat. No. 4,332,518. This application Feb. 1, 1982, Ser. No. 344,604
Int. Cl.³ F03D *1/02*
U.S. Cl. 415—2 A **7 Claims**



1. A power generating device comprising:

a fluid flow velocity augmentor structure means being substantially the shape of a concentric interior section of a hollow toroid of general arbitrary cross-section in both vertical and horizontal planes, meaning that in both a vertical and horizontal plane cross-sections may not be limited to circular arc and circular sections respectively, providing thereby open peripheral fluid flow channel means and providing augmented flow velocity regions about the exterior periphery of said fluid flow augmentor structure wherein a plurality of interconnected fluid impact impeller assemblies are mounted within said peripheral fluid flow channel;

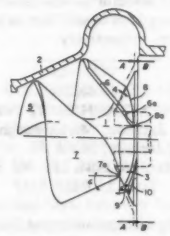
fluid impact impeller yaw means about said toroid centroidal axis; wherein the improvement comprises fluid impact impeller system assembly thrust, yaw and fluid impact load—i.e., TY&L—control means being substantially a device establishing thrust force differences between substantially diametrically located TARP impact impeller assemblies causing said assemblies to yaw out of high velocity fluid streams and into shielded stagnation or low velocity wake flow fields about the TARP body.

4,540,334

OPEN-TYPE CENTRIFUGAL PUMP WITH SINGLE-BLADE IMPELLER

Martin Stähle, I der Gige 392, 8213 Neunkirch, Switzerland

Filed Nov. 29, 1983, Ser. No. 556,165
Claims priority, application Switzerland, Dec. 22, 1982, 7505/82; Apr. 20, 1983, 2121/83
Int. Cl.³ F04D *17/06, 7/02*
U.S. Cl. 415—72 **22 Claims**



1. A centrifugal pump of the open type with a single-blade impeller, in particular for pumping viscous media, wherein the discharge end of the blade, with clearance, grazes a housing wall through which the shaft of the impeller passes, and the blade flank on the delivery side of the pump terminates prior to

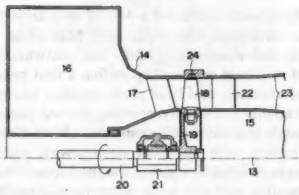
the housing wall in a leading edge which extends between the tip of the end edge of the blade and the hub of the impeller, characterized in that the housing wall is a right truncated cone, wherein the leading edge of the impeller blade flank on the delivery side grazing the truncated-cone wall with clearance (4; 24) extends from the blade outlet tip over a relatively long distance of at least 20° up to a point at which it terminates in the impeller hub.

4,540,335

CONTROLLABLE-PITCH MOVING BLADE TYPE AXIAL FAN

Nobuyuki Yamaguchi, Takasago, and Hiroshi Sugano, Nagasaki, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,550
Claims priority, application Japan, Dec. 2, 1980, 55-172122
Int. Cl.³ F01D 7/00
U.S. Cl. 415—129 **8 Claims**



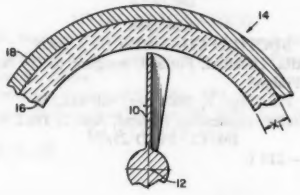
1. In an axial fan of the controllable-pitch moving blade type for providing an air flow ranging from a large air flow to a small air flow, comprising a fan rotor hub rotatable about an axis, a plurality of movable blades extending radially outwardly from said hub, and each having a radially outer end and a variable setting angle inclined relatiive to said rotor hub axis, a controllable-pitch mechanism mounted in said hub for changing the setting angle of said blades during operation, each of said blades having a tip at the radially outer end thereof more remote from said hub with the tips of said blades traveling in a tip circle, an imperforate axially extending casing laterally enclosing said blades and including a wall having an inner wall surface spaced closely outwardly from the tips of said blades and said wall extending radially outwardly from said inner surface, wherein the improvement comprises an annular circumferentially extending recess formed in said inner wall surface with the base of the recess spaced radially outwardly from said inner wall surface and located within said wall, said recess aligned opposite and closely outwardly from said tip circle, a casing treatment located in said recess and extending radially outwardly from said inner wall surface of said casing into said recess and extending annularly around the circumference of said recess, said casing treatment having a radially inner surface generally flush with said inner wall surface of said casing, said casing treatment extending in the axial direction of said hub for at least a portion of the axial dimension of said blades and the axial extent of said casing treatment remains constant while the axial extent of the tips of said blades vary in accordance with the air flow with the axial extent determined by said controllable-pitch mechanism and the axial extent of the tips of said blades ranging from an axial dimension greater than the axial extent of said casing for the larger air flow to an axial dimension less than the axial extent of said casing for the small air flow, whereby said casing treatment affords operating conditions providing high pressure in the low volume range and also permitting improvement of the stall characteristics toward the low flow side.

4,540,336

OXIDIZING SEAL FOR A TURBINE TIP GAS PATH

James D. Cawley, Cleveland Hts., Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 19, 1984, Ser. No. 602,050
Int. Cl.³ F01D 11/08
U.S. Cl. 415—174 **13 Claims**



1. In a gas path seal for a turbine or the like having a plurality of blades mounted for rotation about an axis, an improved shroud surrounding the tips of said blades in substantially concentric relationship to said axis, said shroud comprising

an annular substrate of an oxidizable intermetallic compound of a silicide having a high melting point spaced from the tips of said blades, and

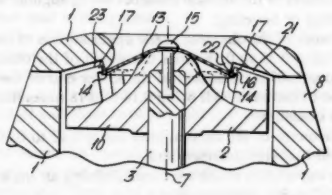
an oxide layer of silica that is abradable relative to said blades and closely spaced to said blade tips covering said intermetallic compound to form a seal surface so that said oxide layer abrades in a rub area on said surface when said blades contact said layer thereby reducing the thickness of said layer in said rub area whereby said intermetallic compound adjacent to said rub area oxidizes to reform the seal surface.

4,540,337

RAM AIR TURBINES

Sten O. Olsen, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrikk, Norway

Filed May 9, 1983, Ser. No. 492,717
Claims priority, application Norway, May 10, 1982, 821533
Int. Cl.³ F01D 7/02
U.S. Cl. 415—141 **8 Claims**



1. A ram air turbine for driving an electric generator in a missile, the turbine comprising a turbine housing having a flow passage for ducting the incoming ram air, a turbine wheel having blades to which the ram air is supplied from said flow passage, wherein the turbine wheel includes means actuated by centrifugal force upon an increase in the rotational speed of the turbine sheel for uniformly restricting the cross section of the flow passage to all of said turbine blades and thus the amount of ram air acting on the blades of the turbine wheel to an extent depending upon the rotational speed of the turbine wheel,

wherein the turbine wheel is a radial turbine wheel having a protruding central hub portion and the incoming ram air is incident upon the turbine wheel along the axial direction and thereafter flows past the blades in a radial direction,

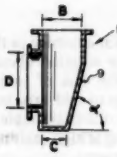
and wherein the centrifugal force actuated means comprises a disc of cup shape and inverted relative to the axial direction of the incoming ram air, the central portion of said disc being attached to said protruding hub of said radial turbine wheel, said disc being manufactured from a resilient material which upon rotation of the turbine wheel allows straightening-out deflection of the cup-shaped disc due to centrifugal forces, the outer edges of the disc lifting from an undeflected position against the turbine wheel.

4,540,338

SUCTION CHAMBER IN A FAN

Olli J. Pukkila, Helsinki, Finland, assignor to Oy Nokia AB, Helsinki, Finland

Filed Apr. 1, 1983, Ser. No. 481,158
Claims priority, application Finland, Apr. 5, 1982, 821186
Int. Cl.[3] F01D *25/24*
U.S. Cl. 415—219 C **3 Claims**



1. In a fan, a suction chamber, which comprises:
(a) a rectangular front wall having
(i) a suction inlet therein, and
(ii) a width defining the width of the suction chamber;
(b) a back wall spaced from said front wall and including:
(i) an upper section parallel with said front wall, and
(ii) a lower section slanting downwardly towards the front wall;
(c) two side walls connecting sides of the front and back walls;
(d) a top wall connecting the tops of the front and back walls, and defining the depth of the chamber at the upper section of the back wall;
(e) a bottom wall connecting the bottoms of the front and back walls and defining the depth of the chamber at a lower end of the lower section of the back wall;
(f) the corners of the suction chamber being angular without rounding or beveling;
(g) the depth of the chamber at the upper section of the back wall being 0.35 to 0.38 times the width of the chamber;
(h) the depth of the chamber at the lower end of the lower section of the back wall being 0.14 to 0.18 times the width of the chamber;
(i) the diameter of the suction inlet being 0.42 to 0.50 times the width of the chamber; and
(j) the lower section of the back wall defining an angle of 67° to 78° C. with the horizontal.

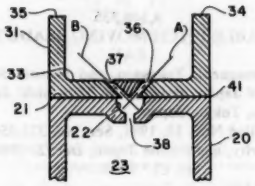
4,540,339

ONE-PIECE HPTR BLADE SQUEALER TIP

Richard L. Horvath, Hamilton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 1, 1984, Ser. No. 616,380
Int. Cl.[3] F01D *5/20*
U.S. Cl. 416—92 **3 Claims**

1. An improved rotor blade for a turbine engine which comprises:
a. a hollow casting including means for mounting said blade to the rotor of said turbine, and a cast end wall at the radially outward end thereof, said casting having cambered side walls defining an interior chamber having an inlet thereof near said mounting means;
b. a channel defined in the radially outwardly facing surface of said cast end wall and along a substantial portion of a chord of said blade, and an opening defined through said end wall and communicating with said channel, said opening comprising an outlet through said end wall for passage of coolant fluid through said blade;
c. a tip end closure for said blade bonded to said end wall of said casting, said tip end closure comprising a base plate member of peripheral contour coincidental with that of



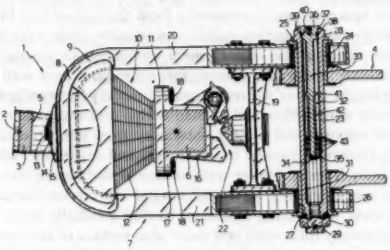
said cambered side walls and a pair of tip side walls faired with said cambered side walls, said base plate member bonded to and cooperating with said outwardly facing surface of said cast end wall to define a first passageway along said channel, said base plate member having a plurality of radially outwardly opening second passageways therethrough and disposed along the chord thereof and communicating with said first passageway, said second passageways defined along axes inclined to said base plate and intersecting said side walls whereby said coolant fluid flowing therethrough is directed against a surface of said tip side walls.

4,540,340

HELICOPTER ROTOR

Emilio Pariani, Cardano al Campo, Italy, assignor to Costruzioni Aeronautiche Giovanil Agusta S.p.A., Italy

Filed May 2, 1984, Ser. No. 606,156
Claims priority, application Italy, May 5, 1983, 67487 A/83
Int. Cl.[3] B64C *27/32*
U.S. Cl. 416—145 **3 Claims**



1. A helicopter rotor comprising a central hub, at least one blade extending radially outward from said hub, means for connecting said blade to said hub, and means for static balancing said rotor;
said connecting means comprising a number of pins extending through an inner end portion of said blade, at least one of said pins being hollow and having an axial hole, and said balancing means being housed inside said hollow pin and comprising a rod fitted inside said axial hole, and a variable number of annular counterweights slidably mounted on said rod;

said counterweights being selected from a number of counterweights of different mass, and first and second clamping means being provided for releasably clamping said counterweights axially on to said rod and said rod inside said hollow pin respectively.

4,540,341

ADJUSTABLE PROPELLER FOR MARINE VESSEL DRIVE

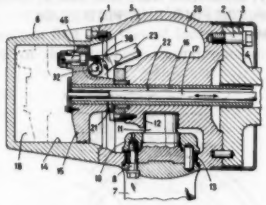
Wolfgang Wührer, Ravensburg, Fed. Rep. of Germany, assignor to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Dec. 28, 1983, Ser. No. 566,304

Claims priority, application Switzerland, Jan. 17, 1983, 228/83

Int. Cl.[3] **B63H** *3/08;* **B64C** *11/40*

U.S. Cl. 416—157 R **11 Claims**



1. An adjustable pitch propeller device for marine vessels, comprising:

a rotatable propeller having a longitudinal axis of drive rotation;

a rotatable propeller shaft for driving said rotatable propeller;

a plurality of propeller blades each rotatably mounted in said rotatable propeller to define a respective axis of pitch rotation extending substantially transverse to said longitudinal axis of drive rotation;

each propeller blade of said plurality of propeller blades defining a respective adjustably predeterminate angle of pitch rotation about said respective axis of pitch rotation in relation to said longitudinal axis of drive rotation;

a pitch adjusting mechanism for substantially simultaneously effecting substantially uniform equal nominal adjustments of said respective adjustably predeterminate angle of pitch rotation of each said propeller blade;

said pitch adjusting mechanism comprising an adjustment motor;

said pitch adjusting mechanism comprising respective connecting means operatively connecting each said propeller blade with said adjustment motor;

each said connecting means comprising a respective pitch correction mechanism for selectively and individually modifying said adjustably predeterminate angle of pitch rotation of each said propeller blade in relation to said substantially uniform equal nominal adjustments thereof;

each said pitch correction mechanism comprising a correction motor;

a respective pitch sensor associated with each said correction motor for generating a momentary pitch position signal corresponding to the momentary value of said adjustably predeterminate angle of pitch rotation of said respective propeller blade;

at least one drive rotation sensor for generating a respective reference signal for each said propeller blade corresponding to a desired reference value of said adjustably predeterminate angle of pitch rotation as a predeterminable function of a momentary value of angular orientation of said rotatable propeller shaft in rotation to the hull of the marine vessel;

a respective control device operatively associated with each said correction motor for cyclically controlling said correction motor to selectively and individually modify said substantially uniform equal adjustments of each said respective adjustably predeterminate angle of pitch rotation during rotation of said rotatable propeller; and

each said respective control device comprising means for comparing said momentary pitch position signal with said respective reference signal and means for correspondingly activating each said related correction motor.

4,540,342

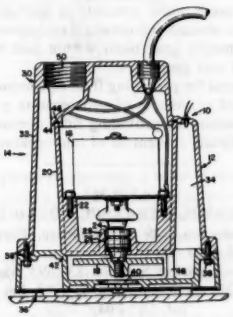
HYDRAULIC SWITCH

Charles W. Steiner, Brooklyn Park, and Loren J. Simer, Minneapolis, both of Minn., assignors to Simer Pump Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 439,284, Nov. 4, 1982, abandoned. This application Oct. 29, 1984, Ser. No. 665,928

Int. Cl.[3] **F04B** *49/00*

U.S. Cl. 417—40 **6 Claims**



1. An hydraulic switch for installation in liquid communication means, said liquid communication means having a wall with an opening beneath which liquid flows, said hydraulic switch comprising:

a lid for said opening;

first means for attaching said lid to said wall to close said opening;

means in said lid for venting gaseous fluid from said liquid communication means;

a float movable between a first position wherein said venting means is open and a second position wherein said float closes said venting means;

means for guiding said float between said first and second positions;

an electrical switch for opening and closing an electrical circuit, said electrical switch being operable with movement of said float between said first and second positions; and

second means for operably attaching said float, said guiding means and said electrical switch on one side of said lid;

whereby said float, said guiding means and said electrical switch are operably installed within said liquid communication means on attachment of said lid to said wall.

4,540,343

SPHERICAL GEAR PUMP

Gerard T. Perkins, Livonia, Mich., assignor to International Hydraulic Systems, Inc., Southgate, Mich.

Filed Nov. 17, 1982, Ser. No. 442,253

Int. Cl.[3] **F04B** *19/02, 49/08;* **F04C** *21/00*

U.S. Cl. 417—218 **53 Claims**

1. A pump comprising:

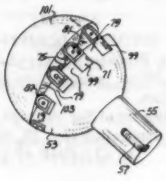
a housing;

a gear rotatably, mounted about an axis in said housing, said gear having a plurality of peripherally spaced apart gear

teeth defining a plurality of chambers between adjacent spaced apart gear teeth, said gear teeth each having a radial top surface defining a radial end face of said gear;

a plurality of separate gear teeth wherein each separate gear tooth is nested within one of said chambers and each separate gear tooth has a radial top wall;

cam means facing said end face of said gear and in continuous engagement with all said radial top walls of said separate gear teeth upon rotation of said gear for causing progressive inward and outward reciprocating movement of said separate gear teeth within said chambers upon rotation of said gear;



fluid inlet means for providing fluid communication adjacent the outward movement of said separate gear teeth;

fluid outlet means for providing fluid communication adjacent the inward movement of said separate gear teeth.

4,540,344

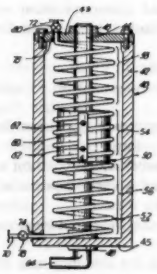
ENERGY TRANSFER DEVICE

Charles A. Mulvenna, 129 Cairn Grove, Kingston, Ontario, Canada (K7M 4C1)

Continuation-in-part of Ser. No. 130,093, Mar. 17, 1980, abandoned. This application Sep. 7, 1983, Ser. No. 530,137

Int. Cl.[3] **F04F** *7/00*

U.S. Cl. 417—240 **18 Claims**



1. An apparatus comprising:

(a) a supporting structure;

(b) a tube of selected length adapted for connection in fluid flow communication with an external fluid system and having respectively first and second opposite ends, at least a portion of said selected length of tube being coiled into the form of an open helix wound radially symmetrically about the axis of the helix and extending longitudinally along the axis of such helix, the wall of such tube being sufficiently rigid such that the tube does not expand radially during normal operating pressures of a fluid contained in the tube;

(c) means retaining said helical portion on said supporting structure such that the axis of the helix remains in essentially a fixed position relative to the supporting structure;

(d) means fixedly anchoring the helical portion, at a first position thereon to a rigid supporting structure preventing movement thereof at such position about the axis of the helix, said helical portion at a second position spaced from said first position axially along the helix being movable in an arc about the axis of the helix; and

(e) means positively to move said helical portion at said second position a preselected equal amount in an arc in each of opposite directions about the axis of the helix alternately to increase and decrease the radius of curvature of the helical portion between said first and second positions whereby in each of the opposite directions there results a progressive change in axial tube velocity along the helical portion of the tube from one to the other of said first and second positions.

4,540,345

PRECOMPRESSION VALVE FOR HYDRAULIC PUMPS

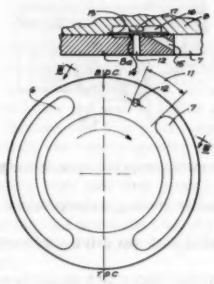
Hugh I. Frazer, Lower Portland, Australia, assignor to Ifield Engineering Pty. Limited, Dural, Australia

Filed May 26, 1983, Ser. No. 498,453

Claims priority, application Australia, Jun. 3, 1982, PF4279

Int. Cl.[3] **F04B** *1/12;* **F01B** *13/04*

U.S. Cl. 417—269 **6 Claims**



1. A hydraulic pump for liquids comprising a body, a cylinder rotor surrounded by and mounted in an external support, the body having a face in which are an inlet port and an outlet port for the liquid to be pumped, the rotor carrying a plurality of equiangularly spaced cylinders, pistons in the cylinders being caused to reciprocate as the rotor is rotated by cam means, the cylinders being moved sequentially over said face past the inlet port as liquid is drawn into the cylinder and sequentially past the outlet port as the liquid is forced out of the outlet face by the action of the pistons, there being in said face between the inlet port and the outlet port a precompression zone past which the cylinders move in passing from the inlet port to the outlet port, there being in said zone an opening communicating with the outlet port characterized in that such communication is normally closed by a flat spring valve, said flat spring valve being retained by said body, the flat spring valve consisting of a central portion from which at least two arms extend radially, the valve being arranged to open on the liquid pressure in a cylinder exceeding the liquid pressure at the outlet port.

4,540,346

DIAPHRAGM PUMPS

Anthony R. Davies, Cirencester, England, assignor to VFP Fluid Power Limited, United Kingdom

Filed Jun. 30, 1983, Ser. No. 509,954

Claims priority, application United Kingdom, Jul. 5, 1982, 8219415

Int. Cl.[3] **F04B** *35/02*

U.S. Cl. 417—273 **7 Claims**

1. An improved diaphragm pump assembly of the type comprising a drive shaft (1); a plurality of cylinders (5;6) whose axes are spaced about the drive shaft axis (1); a piston (A;B)

received by each cylinder (5;6) for reciprocating movement therewithin; a plurality of pressure chambers (9;9*a*) defined by internal surfaces (10; 10*a*) of a body (11) and adapted to be filled with a pressurized liquid; a flow channel (12; 12*a*) disposed within each of the pressure chambers, each flow channel being bounded by at least one resilient, deflectable, diaphragm wall (16, 17; 16*a*, 17*a*) and having a one-way inlet valve (13; 13*a*) and a one-way outlet valve (14; 14*a*), the arrangement being such that, in use, rotation of the drive shaft causes reciprocation of the pistons within their respective cylinders thereby displacing liquid in the pressure chambers and causing cyclical changes in the volume of and pressure subsisting within the respective flow channels, the improvement comprising:

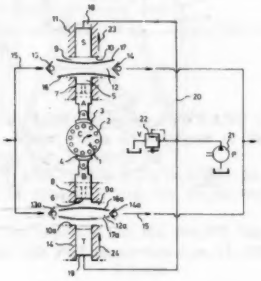
first and second compensating pistons (S;T) in said body (11), each compensating piston being associated with a respective pressure chamber (9;9*a*), flow channel (12;12*a*) and main piston (A:B);

hydraulic circuit means establishing hydraulic communication between first and second faces, respectively located on each of the first and second compensating pistons remote from its respective pressure chamber, and cooperatively interconnecting the first and second compensating pistons so that movement of either of the first and second compensating pistons effects a reactive movement of the other of the first and second compensating pistons;

hydraulic control means including a control pump (21), common to the first and second compensating pistons (S;T) to create an adjustable, predetermined reference hydraulic pressure in the

hydraulic circuit means so that the compensating pistons are held in a first position by the predetermined hydraulic pressure and in the event that the liquid pressure in one of the pressure chambers (9; 9*a*) exceeds said predetermined pressure, to automatically move one of the compensating pistons from said first position in a manner tending to prevent any further rise in the pressure in said one pressure chamber and in response thereto cause movement of the other of the compensating pistons,

whereby pressure above the pedetermined, reference pressure is absorbed by the compensating pistons so as not to unduly stress the diaphragm walls associated with the first and second compensating pistons.



4,540,347

GEROTOR PUMP

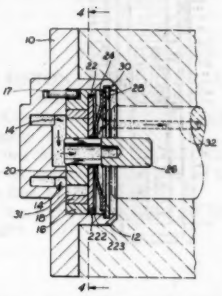
Robin E. Child, Wellesbourne, England, assignor to Concentric Pumps Limited, Birmingham, England

Continuation of Ser. No. 452,247, Dec. 22, 1982, abandoned. This application Jan. 23, 1985, Ser. No. 693,301

Claims priority, application United Kingdom, Dec. 24, 1981, 8138869

Int. Cl.[3] **F04B** *49/08;* **F04C** *2/10, 15/04*

U.S. Cl. 417—310 **2 Claims**



1. A gerotor pump comprising a base having an integral circular wall projecting therefrom, a pair of ports in said base opening into a surface of the base within the wall, a ring rotatably mounted within the wall in contact with said surface, stops to limit rotation of said ring to 180°, an internally lobed rotor eccentrically journaled in said ring, a second, externally lobed rotor which is located within the first rotor and is fixed on a drive shaft concentrically with said ring, a plate which has an aperture through which the drive shaft extends to the second rotor, and which covers said rotors on the drive shaft side thereof, and a leaf spring which also has an aperture through which the drive shaft extends, and which bears against said plate to maintain the plate in sealing contact with said rotors against normal operating pressure, said plate being axially movable away from the rotors in the event of excess back pressure to provide a leakage path across the rotors.

4,540,348

OILWELL PUMP SYSTEM AND METHOD

Paul B. Soderberg, Houston, Tex., assignor to Soderberg Research & Development, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 308,847, Nov. 19, 1981, abandoned. This application Jul. 26, 1982, Ser. No. 401,644

Int. Cl.[3] **F04B** *47/08*

U.S. Cl. 417—383 **18 Claims**

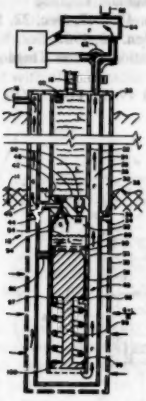
1. A method for transmitting power to an hydraulic pump, comprising:

connecting the power chamber of said pump to a suitable pressurizing means by suitable tubing means;

filling a first portion of said tubing means adjacent said pump with a first hydraulic fluid;

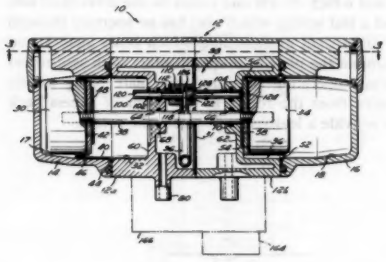
filling a second portion of said tubing means adjacent said

pressurizing means with a second hydraulic fluid less compressible than said first hydraulic fluid; and



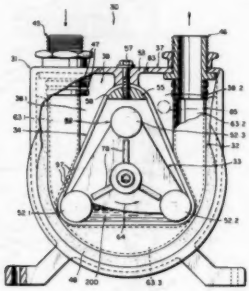
operating said pressurizing means to alternately pressurize and depressurize said hydraulic fluids in said tubing means to operate said hydraulic pump.

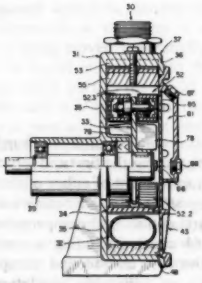
4,540,349
AIR DRIVEN PUMP
Benjamin R. Du, 12 Morgan, Irvine, Calif. 92714
Filed May 16, 1984, Ser. No. 610,957
Int. Cl.³ F04B *9/12*
U.S. Cl. 417—393 **8 Claims**



1. A fluid-driven pump, comprising:
housing means defining a first cavity, a second cavity, and a third cavity;
a piston shaft slidably positioned within housing means;
a first piston mounted to a first end of the piston shaft;
a second piston mounted to a second end of the piston shaft; the first and second pistons being reciprocally movable through intake and exhaust strokes within the first and second cavities, respectively, for pumping a product therefrom;
means for supplying a pressurized fluid to said third cavity;
valve means disposed within said third cavity having a reciprocable valve stem opposite ends of which extend into said first and second cavities to be actuated by the pistons during portions of the intake strokes for alternately venting and pressurizing the first and second cavities with said pressurized fluid from said third cavity, said valve stem including a first passage and a second passage for alternatively placing the first and second cavities, respectively, in communication with the pressurized fluid from said third cavity and the ambient air pressure;
a valve body slidably mounted along the length of said valve stem for selectively placing the first and second passages in communications with the pressurized fluid within said third cavity and the ambient air pressure; and
over-center spring means disposed within said third cavity and cooperating with said valve body for biasing said valve body toward the cavity being vented, said over-center spring means reversing direction as the valve stem travels through a stroke of less length than the distance the pistons travel during their intake and exhaust strokes.

4,540,350
STRICTURE PUMP
Manfred Streicher, Bahnhofstrasse 22, 7141 Beilstein, Fed. Rep. of Germany
Filed May 14, 1984, Ser. No. 610,011
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320091
Int. Cl.³ F04B *43/12, 45/08*
U.S. Cl. 417—475 **12 Claims**





1. Stricture pump comprising:
a casing (**31**) having
a peripheral wall (**37**) which, at least in a pump portion connecting a suction chamber (**38.1**) to a delivery chamber (**38.2**) in the casing, is of circular cylindrical shape,
a flat rear end wall (**35**) which closes the casing at the rear,
a flat front wall (**36, 43**) which closes the casing at the front,
a suction branch (**45**) through which the fluid to be pumped is drawn by suction into the suction chamber, and
a delivery branch (**46**) through which the fluid is forced out of the delivery chamber,
a rotor (**33**) which rotates, in the interior space (**38**) of the

casing, in the direction from the suction chamber to the delivery chamber,

whose rotor axis coincides with the cylinder axis of the pump portion, and

a hose (32) which is disposed, between the suction branch (45) and the delivery branch (46), along the peripheral wall (37),

whose periphery corresponds at most to twice the distance between the rear end wall (35) and the front wall (43), and

which has substantially no restoring power of its own, characterised in that

the rotor (33) has at least two constricting members (52) whose axes are disposed concentrically around the axis of the rotor,

a dividing member is provided which is in the form of a band and is substantially stable in respect of length, and which in the interior space (38) between the delivery chamber (38.2) and the suction chamber (38.1) is fastened to a fastening part (53, 55, 57) outside the outermost periphery of the rotor, in such a manner as to be fixed to the casing and in addition is disposed around the rotor and, at least in its suction chamber portion, has a width such that on the rotation of the rotor at least the suction chamber portion is pushed to and fro sealingly in relation to the rear end wall (35) and the front wall (36, 43), whereby the suction chamber is vacuum-tightly divided off from the delivery chamber,

the hose (32) lies between the inner wall of the pump portion and the dividing member, and

in the interior space (38) of the casing (31) a sealing liquid is provided.

4,540,351

PRESSURE PUMP HAVING JAWS AND END-SLOTS

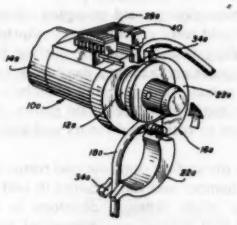
Raymond G. Olson, Niles, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

PCT No. PCT/US83/00528, § 371 Date Oct. 24, 1983, § 102(e) Date Jan. 24, 1984, PCT Pub. No. WO83/04285, PCT Pub. Date Dec. 8, 1983

Continuation-in-part of Ser. No. 380,977, May 24, 1982, abandoned. This PCT application Apr. 11, 1983, Ser. No. 572,496

Int. Cl.³ F04B *43/12, 45/08*

U.S. Cl. 417—476 **2 Claims**



1. In a pressure pump for conveying fluids through flexible tubing which comprises a pressure member of generally circular periphery, means for moving said pressure member in orbital motion about an axis of rotation, and a sleeve member positionable about said pressure member and spaced for receiving and retaining the flexible tubing in an annular space between the pressure member and the sleeve member with the flexible tubing surrounding said pressure member for pumping of fluids through said flexible tubing, the sleeve member being divided into a pair of jaws hinged together at one end to permit opening and closing of the jaws about the pressure member to facilitate installation of the flexible tubing, the improvement comprising, in combination:

said jaws including end surfaces which abut together when said jaws are in closed position and means defining slots in said end surfaces for accomodating passage of said flexible tubing into and out of said annular space when said end surfaces of said jaws are in abutting relation, and

movable latch means for retaining said end surfaces of said jaws in abutting relation, said latch means including means defining a slot for accomodating passage of said flexible tubing when said end surfaces of said jaws are retained in abutting relation so that said flexible tubing which passes through said slots in said jaw end surfaces and said latch means is folded aout an angle which is substantially less than 180°.

4,540,352

PENDULAR PISTON PUMP HAVING A CUP-SHAPED SEALING ELEMENT

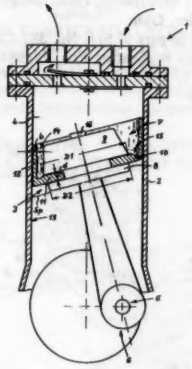
Erich Becker, Glöcklehofweg 13, D-7812 Bad Krozingen, Fed. Rep. of Germany

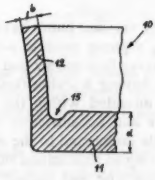
Filed Sep. 9, 1983, Ser. No. 531,722

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 3233854; Dec. 17, 1982, 3246782

Int. Cl.³ F04B *21/02;* F16J *9/08*

U.S. Cl. 417—571 **11 Claims**





1. A pendular pump comprising a housing member having an internal surface bounding internal space including an elongated cylinder bore; a pendular piston member movably received in said cylinder bore and delimiting a pumping chamber therein, said housing member having fluid inlet and fluid outlet means communicating with said pumping chamber during different stages of pendular movement of said piston member and said piston member including a piston and a connecting member rigid with said piston; means for moving said piston member in said cylinder bore so that said piston member performs a pendular movement axially of said cylinder bore, said moving means including a crank drive articulately connected to said connecting member so that said piston member performs said pendular movement during the operation of said crank drive; and sealing means interposed between said piston member and said internal surface and including at least one

resilient sealing element having a substantially radially extending supporting section at least partially mounted on said piston member, at least one lip section having a substantially constant thickness and being urged into uninterrupted sealing contact with said internal surface during each stage of pendular movement of the piston member solely by the resiliency of the material of said sealing element, and a third section between and integral with said supporting and lip sections, said third section mounting said lip section on said supporting section for ready tiliting relative thereto and having a groove therein which extends circumferentially of said sealing element between said supporting section and said lip section to facilitate tilting of said lip section relative to said supporting section in accordance with the geometry of pendular movement of said piston member, said supporting section projecting radially outwardly beyond said piston member and having a thickness exceeding that of said lip section to guide said piston member in said bore and to maintain the piston member out of contact with said internal regardless of the extent of wear upon said lip section.

4,540,353

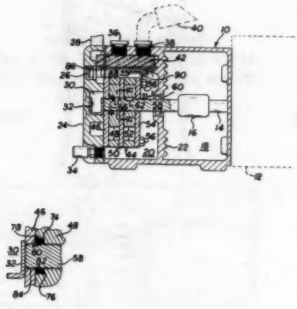
TWO STAGE VACUUM PUMP WITH SHAFT SEAL

Gary P. Murray, Montpelier, Ohio, assignor to Robinair Division, Montpelier, Ohio

Continuation-in-part of Ser. No. 387,620, Jun. 11, 1982, abandoned. This application Feb. 8, 1984, Ser. No. 578,136

Int. Cl.[3] **F04C** *2/00, 11/00, 27/02, 29/02*

U.S. Cl. 418—13 **3 Claims**



1. A two stage rotary vacuum pump having a casing including a cover including a pump module within the casing attached to the cover having first and second pumping chambers defined therein each having a cylindrical circumference, a rotor shaft rotatably mounted within the module extending through the chambers and eccentrically related thereto, an electric motor drivingly connected to the rotor shaft, first and second rotors each having an axis, lateral sides, and fixed to the shaft located within the first and second chambers, respectively, at least one vane movably mounted in each rotor extending from the periphery thereof having an outer end engaging the associated chamber circumference, a valve plate located intermediate the rotors having a port defined therein establishing communication between the chambers at predetermined rotational positions of the rotors, an exhaust plate disposed adjacent the rotor having an exhaust port defined therein selectively communicating with the second chamber at a predetermined rotational position of the second rotor, the improvement comprising, said pump module including an inlet face plate adjacent the first rotor having parallel sides and adapted to be located adjacent the casing cover, the rotor shaft having a free end rotatably received and supported within said inlet face plate, and a fluid seal circumscribing the rotor shaft within the first rotor and adjacent said inlet face plate sealing the rotor shaft and first rotor comprising a recess defined in the first rotor adjacent said inlet face plate and concentric to the rotor shaft, said fluid seal comprising an O-ring located within said recess, an annular groove circumscribing the rotor shaft adjacent said inlet face plate, and a snap ring received within said groove positioning said fluid seal upon the rotor shaft.

4,540,354

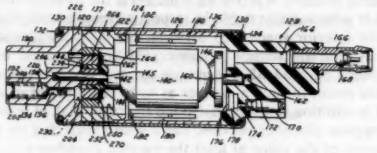
ROTARY FUEL PUMP

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Continuation-in-part of Ser. No. 403,097, Jul. 29, 1982,. This application Dec. 5, 1983, Ser. No. 557,468

Int. Cl.[3] **F04C** *2/10, 15/02;* **F16K** *15/14, 21/04*

U.S. Cl. 418—15 **3 Claims**



1. In a rotary pump for pumping liquid,

(a) a rotor combination utilizing circumferentially disposed expanding and ensmalling, positive-displacement, pumping chambers,

(b) a first circumferentially reduced pressure inlet area on said rotor combination,

(c) a second circumferentially increased pressure outlet area on said rotor combination spaced circumferentially from said first area,

(d) a first means on one side of said rotor combination comprising an inlet housing having an inlet opening at one portion and a face plate at another portion lying directly adjacent said rotor combination, said face plate having a passage and connected ports communicating with said inlet opening and with said first circumferential reduced pressure inlet area of said rotor combination, said face plate having also an outlet port facing said rotors in the second circumferential area,

(e) outlet housing means forming an outlet chamber on the side of said rotors opposite said inlet housing to receive outlet pressure from said outlet port,

(f) second means closing said pumping chambers on the other side of said rotor combination comprising a flexible, resilient, sealing disc having one surface lying directly against said rotors and having a flexible peripheral margin terminating outside said pumping chambers, said margin being free to move away from said rotors, and

(g) power means to rotate said rotors and said disc simultaneously,

(h) said disc on the surface opposite said rotors being open to said outlet chamber and the pressure in said outlet chamber whereby when pressure develops in the pumping chambers in said second circumferential area above the pressure in said outlet chamber, the periphery of said disc will flex to admit pumping fluid to said outlet chamber.

4,540,355

AXIAL SEALING DEVICE FOR A SCROLL-TYPE FLUID DISPLACEMENT APPARATUS

Masakatsu Sakaki, Isesaki, and Masaharu Hiraga, Honjo, both of Japan, assignors to Sanden Corporation, Japan

Filed Mar. 12, 1984, Ser. No. 588,401

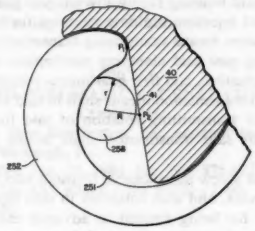
Claims priority, application Japan, Mar. 15, 1983, 58-36345[U]

Int. Cl.[3] **F01C** *1/04, 19/08, 21/00*

U.S. Cl. 418—55 **6 Claims**

1. In a scroll-type fluid displacement apparatus including an orbiting scroll and a stationary scroll each having an end plate

and a spiral wrap extending from one side of said end plate, said spiral wraps interfitting at an angular and radial offset to make a plurality of line contacts between the spiral curved surfaces, which define fluid pockets, and drive means operatively connected to said orbiting scroll for orbiting said orbiting scroll relative to said stationary scroll while preventing rotation of said orbiting scroll to thereby change the volume of said fluid pockets, said scrolls each having a seal element disposed on its axial end surface, and a discharge port formed through said end plate of one of said scrolls at a position near the center of said spiral element of said scroll, the improvement comprising:



said one scroll having a flat, spiral, anti-wear plate fixed to an end surface of said end plate of said scroll facing the axial end surface of said spiral wrap of said other scroll and disposed between said seal element and said end surface to prevent wear and maintain axial sealing, said anti-wear plate covering substantially only the area of the surface of said end plate where said spiral wrap and said seal element make axial contact during orbital motion of said orbiting scroll, said radially inner end of said anti-wear plate defined by a tangent of a circle centered at the center of said discharge port and having a radius greater than the radius of said discharge port, so that said radially inner end of said anti-wear plate does not cover said discharge port.

4,540,356

INTERNAL AXIS CRANKLESS ROTARY PISTON ENGINE

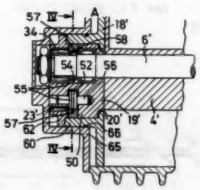
Felix Wankel, Bregenzer Strasse 82, D-8990 Lindau, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,624

Claims priority, application Switzerland, Mar. 3, 1982, 1302/82

Int. Cl.[3] **F01C** *1/10, 21/02*

U.S. Cl. 418—164 **7 Claims**



1. An internal axis crankless rotary piston engine comprising:

an engine casing (**2, 65**);

an internal rotor (**4'**) and an external rotor (**18'**) eccentrically mounted within said casing (**2, 65**) for rotation about axes which are fixed relative to said casing;

external rotor mounting means (**60, 58**) including circularly curved ring bearing means (**58**) rotatively mounting said external rotor;

an internal rotor shaft (**6'**) on said internal rotor (**4'**) rotatively mounted relative to said casing (**2, 65**);

said circularly curved ring bearing means (**60, 58**) of said external rotor mounting means surrounding said internal rotor shaft and being mounted by a plurality of individual bearing means (**52, 53, 54**) which are spaced from one another circumferentially relative to the ring bearing means (**60, 58**) within said ring bearing means (**60, 58**) and which are fixed relative to said casing (**60, 58**).

4,540,357

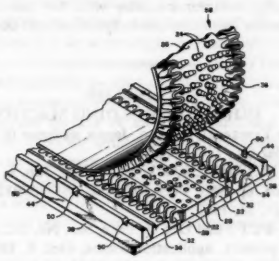
APPARATUS FOR FABRICATING NON-LINEAR SIDE WALL CONVEYOR BELTING

Clarence R. Campbell, Salt Lake City; Elliot S. Mickelson, and Steven A. Baumgartner, both of West Valley City, all of Utah, assignors to Cambelt International Corporation, Salt Lake City, Utah

Filed Dec. 2, 1983, Ser. No. 557,634

Int. Cl.[3] **B29D** *29/00;* **B29H** *7/22*

U.S. Cl. 425—28 B **9 Claims**



1. A mold for use between platens of a press in fabricating conveyor belting having undulated side walls comprising:

means for supporting uncured conveyor belting material during curing;

inner and outer side wall mold components capable of forming uncured side wall material into an undulated shape, at least one of said inner and outer side wall components being movable with respect to the other between an open position wherein the inner and outer side wall components are spaced apart a sufficient distance to permit placement of uncured side wall material therebetween, and a closed position wherein the adjacent faces of the inner and outer side wall mold components are spaced apart a distance corresponding to a suitable thickness of undulated side wall; and

means for supporting formed undulated side wall material in a suitable juxtaposition and orientation for simultaneous curing with the conveyor belting material so that when the mold is placed between the platens of a press, the undulated side wall material and the conveyor belting material will form a unitary bond as they are cured together under suitable conditions of heat and pressure.

4,540,358

APPARATUS FOR THE MANUFACTURE OF A PRECAST BUILDING ELEMENT OF CONCRETE

Pentti Virtanen, T-linja 38 A, 37800 Toijala, Finland

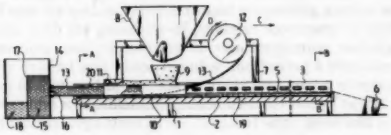
PCT No. PCT/FI83/00029, § 371 Date Nov. 30, 1983, § 102(e) Date Nov. 30, 1983, PCT Pub. No. WO83/03571, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 15, 1983, Ser. No. 558,418

Claims priority, application Finland, Apr. 16, 1982, 821340

Int. Cl.[3] B28B *21/06*

U.S. Cl. 425—63 6 Claims



1. Apparatus for manufacturing a precast hollow concrete slab element comprising an elongated stationary base, a relatively flat concrete layer cast on said elongated base and constituting the bottom face of said slab element, a frame member positioned in vertical spaced relation to said elongated base and adapted to move in spaced parallel relation to said base, a reel mounted on said frame member, a flexible resilient tube positioned on said reel, a fluid tank positioned adjacent an end of said base, means for maintaining the fluid in said tank under pressure, an end of said resilient tube connected to said tank, the portion of said tube adjacent said tank supported on a portion of the bottom face of said slab element, a storage receptacle for concrete supported on said frame member, said storage receptacle having discharge means for delivering concrete onto said bottom face of said slab element and around said flexible tube contemporaneous with the movement of said frame member from one end to the other end of said stationary base.

4,540,359

INJECTION MOLDING MACHINE

Yoshihiko Yamazaki, Nagano, Japan, assignor to Nissei Plastics Industrial Co., Ltd., Japan

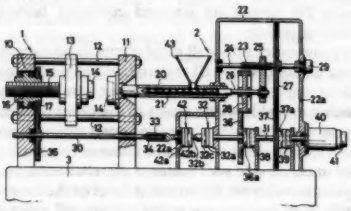
PCT No. PCT/JP82/00402, § 371 Date Jun. 6, 1983, § 102(e) Date Jun. 6, 1983, PCT Pub. No. WO83/01224, PCT Pub. Date Apr. 14, 1983

PCT Filed Oct. 7, 1982, Ser. No. 512,135

Claims priority, application Japan, Oct. 8, 1981, 56-160681; Apr. 15, 1982, 57-62835; Jun. 30, 1982, 57-113603

Int. Cl.[3] B28B *17/00*

U.S. Cl. 425—135 8 Claims



1. An injection molding machine for synthetic resins, including

a clamping mechanism which comprises a machine bed, a fixed plate provided on said machine bed, a movable plate disposed to be moved toward and away from said fixed plate and a guide member for guiding said movable plate toward and away from said fixed plate; molds mounted on opposed surfaces of and between said fixed plate and said movable plate, a clamping plunger connected to said movable plate and extending from said movable plate away from said fixed plate and said plunger being formed with threads in the periphery thereof, a rotary member internally threadedly engaged with said threaded plunger for moving said plunger in an axial direction as said rotary member rotates; and a fixed member fixed with respect to said machine bed and located at the rear of said movable plate away from said fixed plate for retaining said rotary member; and

an injection mechanism which comprises a housing near to said clamping mechanism and on said machine bed, and an injection heating cylinder mounted and positioned on the side of said housing facing toward said clamping mechanism, said injection molding machine further comprising transmission means comprising transmission means shaft extending past said clamping mechanism and said injection mechanism, and first gear means rotatably connected with said transmission means shaft in said clamping mechanism for transmitting rotation of said first gear means caused by said transmission shaft means to said rotary member,

an injection screw advanceable through said injection heating cylinder, and also rotatable in said injection heating cylinder for being rotated to advance material through that said cylinder, a rotary shaft for rotating said injection screw and a second gear for rotating said rotary shaft; means for rotating said injection screw by said rotary shaft through said second gear and these means being provided within said housing, said transmission means shaft in said housing supporting a third gear meshed with said second gear of said means for advancing and rotating said injection screw,

a first electromagnetically-operated clutch mechanism for selectively connecting said transmission means shaft with said third gear, an electric servo-motor as a driving source for driving said transmission means shaft to rotate, a second electromagnetically-operated clutch mechanism disengageable for temporarily stopping and engageable for thereafter starting the application of a turning force of said servo-motor to said clamping mechanism first gear, and a force retaining device comprising an electromagnetically-operated brake for retaining a clamping force on said clamping gear during said temporary stoppage.

4,540,360

APPARATUS FOR PRODUCING A WOUND COIL OF AN ELASTIC MATERIAL

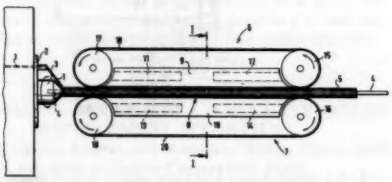
Reinhard W. Leo, Giessener Strasse 38, 6057 Dietzenbach, Fed. Rep. of Germany

Filed Jul. 10, 1984, Ser. No. 629,502

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1983, 3326858

Int. Cl.[3] B29C *25/00*

U.S. Cl. 425—384 10 Claims



1. An apparatus for producing a wound coil of an elastic material such as a polyester or polyamide which stabilizes upon the application of heat, said apparatus comprising:

a coiling head including a winding cone having extending therefrom a mandrel, whereby a monofilament of elastic

material may be fed over said winding cone onto said mandrel to form a coil;

a pair of conveyor means, located on opposite sides of said coil on said mandrel, and defining therebetween a stabilizing zone for moving said coil along said mandrel through said stabilizing zone while heating and thereby stabilizing said coil;

said mandrel extending throughout said stabilizing zone;

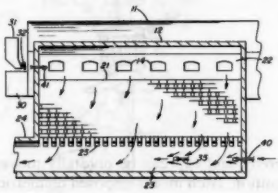
said conveyor means including respective heating elements located on opposite sides of said coil; and

said conveyor means further including respective planar members formed of a heat transmitting material and between which said coil is fed along said mandrel, each said planar member being in contact with said coil and a respective said heating element, thereby transmitting heat from said heating element to said coil.

4,540,361
ENHANCED PNEUMATIC REGENERATOR FLOW CONTROL

Robert Gagne, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1984, Ser. No. 575,092
Int. Cl.³ F24H *7/00*; F27D *17/00*
U.S. Cl. 432—30 **22 Claims**

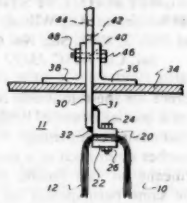


1. A method of operating a regenerative furnace wherein gases are passed through passageways between a combustion chamber and a regenerator bed, injecting a jet of gas into a moving stream of gas in at least one of the passageways so as to affect movement of the stream and to thereby alter the flow pattern of gases between the combustion chamber and the regenerator bed, the jet being a narrow, high velocity jet discharged adjacent to a nozzle surface to flow along the surface and entrain gas within the passageway.

4,540,362
FURNACE CURTAINS

John R. Kurie, Livingston, and Mircea S. Stanescu, Pluckemin, both of N.J., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Sep. 17, 1984, Ser. No. 651,205
Int. Cl.³ F27D *7/00*; A21B *1/00*
U.S. Cl. 432—65 **10 Claims**

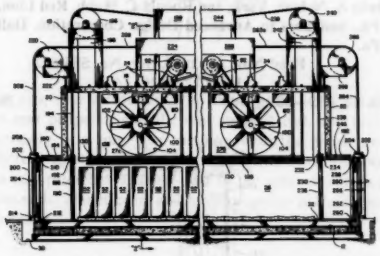


1. A curtain assembly for substantially blocking gas flows comprising a plurality of cord members comprised of heat resistant material, elongate tape means wrapped about said cord members at approximately the mid-point thereof to form a pair of curtain sections each comprised of said cord members, means for securing said tape means to said cord members to form said curtain sections as substantially free hanging and which may be stored independently of means for mounting said curtain assembly in a furnace or the like.

4,540,363
INGOT PUSHER FURNACE

Robert H. Ross, and Robert C. Larko, both of Meadville, Pa., assignors to Seco/Warwick Corporation, Meadville, Pa.

Filed Mar. 1, 1984, Ser. No. 585,324
Int. Cl.³ F27B *9/00*; F27D *7/04*, *3/02*
U.S. Cl. 432—148 **9 Claims**

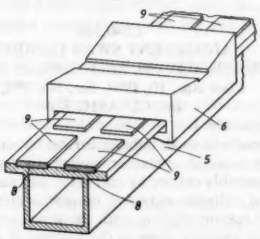


1. An ingot pusher furnace for heating an ingot comprising: an enclosure having a base, a plurality of vertical side walls connected to said base and a top wall, means for heating said enclosure by heating a gaseous medium therein; means for moving said gaseous medium within said enclosure; and a movable baffle suspended from said top wall in spaced proximity from an ingot to be heated, said movable baffle having a first portion oriented at an acute angle with an upper surface of said ingot and a second portion connected to said first portion and oriented substantially parallel to said ingot whereby said gaseous medium contained within said enclosure, when forced between said upper surface of said ingot and said movable baffle changes its velocity uniformly when between said first baffle section and said ingot and maintains a uniform velocity when traveling between said second baffle section and said ingot to effect a selected rate of heat transfer across a length of and a width of said ingot to provide uniform heating throughout said ingot.

4,540,364
PUSHER-TYPE FURNACE

Peter Ebner, Bergham 168, A-4060 Leonding, Austria

Filed Sep. 23, 1983, Ser. No. 535,156
Claims priority, application Austria, Oct. 1, 1982, 3635/82
Int. Cl.³ F27D *3/00*
U.S. Cl. 432—234 **2 Claims**



1. In a pusher-type furnace comprising skid rails for sliding

shoes to carry material to be processed through the furnace, and

slip elements to reduce the friction between the rails and the sliding shoes,

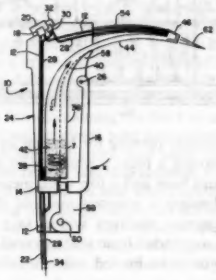
wherein the improvement comprises said slip elements consisting of stationary plates fitted in spaced shallow recesses in the top of said rails and defining gaps therebetween, said slip plates being arranged in two longitudinal rows in the top of each rail and having superficial grooves running at an angle to the rail axis, and said grooves in the plates in one row being arranged as a mirror image of said grooves in the plates in the other row.

4,540,365

DENTAL CLEANSING SYSTEM

Edwin A. Nelson, York, and Ronald C. Webb, Red Lion, both of Pa., assignors to Advanced Design Corporation, Dallastown, Pa.

Filed Nov. 23, 1983, Ser. No. 554,612
Int. Cl.[4] A61C *3/02*
U.S. Cl. 433—88 **20 Claims**



1. A hand-held system adapted to be connected to gas and liquid supply means for delivering an abrasive to a tooth to be cleaned, comprising:

first means connected to the gas supply means for producing a controlled gas stream;

second means connected to the liquid supply means for producing a controlled liquid stream;

a canister containing an abrasive material, said canister having an inlet for receiving one of said gas and liquid streams, and an outlet permitting exiting of an abrasive laden stream;

a mixing chamber receiving said gas, liquid and abrasive laden streams for combining and directing said streams so as to strike a common point on the tooth being cleaned; and

a unitary handpiece for containing said first and second means, said canister and said mixing chamber, said handpiece having means for removably mounting said canister to permit replacement by another canister.

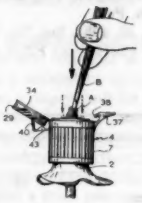
4,540,366

ABSORBENT SWAB IMBIBER

Jean-Yves Belzile, C.P. 100, Saint-Mathieur, Canada

Filed Apr. 10, 1984, Ser. No. 598,578
Int. Cl.[3] A61C *5/14*
U.S. Cl. 433—136 **5 Claims**

1. An absorbent swab imbiber for dental work and the like, comprising a liquid container having an open top neck, a pumping assembly carried by said neck, said assembly comprising a pump cylinder mounted upright within said neck, an intake tube communicating with the lower end of said pump cylinder and opening close to the bottom of said container, a check value at the lower end of said pump cylinder only allowing flow of said liquid through said intake tube from said container into said pump cylinder, a piston rod fixed to said piston at one end and extending coaxial with said pump cylinder upwardly from the upper end of the latter, said piston rod having an enlarged head at its outer end defining a top recess, said piston and piston rod having a bore extending therethrough and making communication between said pump cylinder and said recess, piston stroke limiting means; biasing means biasing said piston and piston rod to an upper limit position in which said top recess is exposed, whereby an absorbent swab can be placed within said recess and pushed to cause depression of said piston rod and piston, so as to cause said liquid already in said pump cylinder to enter said recess and imbibe said absorbent swab; a sleeve member, carried by said neck and surrounding said piston rod, with said head exposed at the top of said sleeve member in the upper limit position of said piston; a cap, removably closing the top end of said sleeve member and overlying said head and having a top wall making a sealing contact with said recess exteriorly of said bore in the closed position of said cap and with said piston in said upper limit position; hinge means between said cap and said sleeve member, whereby said cap can be pivotally moved from open to closed position; latch means disposed diametrically opposite to said hinge means and carried by said sleeve member to engage and latch said cap in closed position; biasing means, automatically causing opening movement of said cap to fully open position upon release of said latching means; said sealing contact being obtained by a boss formed at the inside surface of the top wall of said cap and conforming to the marginal radially external portion of said recess; means being formed on said cap and on the top end of said sleeve member, to center said cap with respect to said sleeve member in the closed position of said cap; wherein said latching means includes a latching member, integrally formed with said sleeve member and diametrically opposite said hinge means; said latching member having a radially-inwardly directed nose; said cap member having a radially-outwardly directed tab at its periphery, said tab being engageable under said nose in the closed position of said cap member; said latching means being made of a flexible material so that one is able to release said nose from said tab, thereby releasing said cap member for its opening.



4,540,367

DENTAL ATTACHMENT STRUCTURE

Josef M. Sulc, 145 Mountain Rd., Wilton, Conn. 06897

Filed May 2, 1984, Ser. No. 606,218
Int. Cl.[3] A61C *13/22*
U.S. Cl. 433—181 **11 Claims**

1. Dental structure for the removable mounting of a dental appliance, such as a partial denture, bridge or similar dental appliance in an oral cavity comprising:

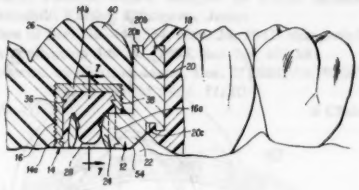
(a) a female member comprised of a metallic material;

(b) mounting means on said female member adapted for mounting the same permanently on an abutment tooth within said oral cavity; said mounting means formed by at least one plate of concave curvature toward the axis of said abutment tooth;

(c) a male member comprised of a resilient non-metallic material;

(d) support means for removably supporting said male mem-

ber within an opening in the base portion of said dental appliance; and



(e) means carried by said male and female members for releasable engagement of said members by snap fit engagement within said oral cavity.

4,540,368

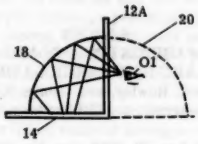
EDUCATIONAL VISUAL APPARATUS

Robert F. Kopacz, c/o Hamill Studios, 345 Centre St., and Timothy Hamill, 345 Centre St., both of Milton, Mass. 02186

Continuation-in-part of Ser. No. 319,214, Nov. 9, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,355

Int. Cl.[3] **G09B** *23/00*

U.S. Cl. 434—276 **6 Claims**



1. A device for observing and photographing tensioned films which include a liquid substance containing a light dispersing agent comprising a supportive structure including a substantially planar base which is transparent to all wave lengths of visible light and at least one wall portion, which is transparent to all wave lengths of visible light and mounted to extend upwardly from said base and slanted relative to said base at an acute angle for supporting tensioned films of variable sizes and shapes on both said base and at least one said transparent wall portion, and means for illuminating the inner surface of the tensioned film including means defining a source of visible light wave lengths for forming a layered spectral pattern of light on the inner surface of the film which is visible through said transparent wall portion.

4,540,369

COUNTERROTATING DUAL-PROPELLER BOAT DRIVE

Richard Caires, 301 E. 75th St., New York, N.Y. 10021

Filed Feb. 22, 1983, Ser. No. 468,302

Int. Cl.[3] **B63H** *5/10*

U.S. Cl. 440—81 **8 Claims**

1. In combination with a watercraft drive unit having a generally horizontal and annular drive support fixed on the craft and a drive shaft projecting from the rear end of the support and rotatable about a drive axis, a propeller assembly comprising:

a hub fixed on the shaft adjacent the support and having a front hub portion immediately behind the rear support end and a rear portion spaced therefrom;

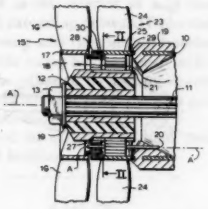
a rear propeller fixed to the rear portion of the hub;

a planet carrier defining a plurality of planet axes parallel to and spaced equiangularly about the drive axis;

means for securing the carrier to the support for fixing of the planet axes relative to the support and drive axis;

a sun gear fixed on the front portion of the hub within the planet axes and axially between the rear hub portion and the rear support end;

respective planet gears meshing with the sun gear and rotatable on the carrier about the planet axes axially between the rear hub portion and the rear support end; and



a front propeller surrounding the planet gears, lying between the rear propeller and the rear support end, and formed internally as a ring gear meshing with the planet gears, whereby rotation of the drive shaft in one direction rotates the rear propeller and sun gear in the same direction and rotates the planet gears and front propeller in the opposite direction.

4,540,370

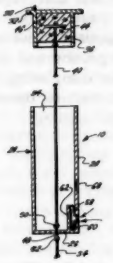
RETRIEVER FOR SUBMERGED OBJECTS

Dellon Hebert, 257 Aline Dr., Breaux Bridge, La. 70517

Filed May 14, 1984, Ser. No. 609,856

Int. Cl.[3] **B63B** *21/52*

U.S. Cl. 441—9 **10 Claims**



1. A retriever for a submerged object, comprising:

a canister having a cap-receiving opening and a sealed aperture;

a floatable cap for placement in selectively sealing relationship to said opening;

a retrieval cord for affixing said cap to said canister;

means for anchoring said canister to said submerged object;

a first seal for said aperture comprised of a water soluble layer affixed to said aperture on the exterior of said canister;

a second seal for said aperture comprising a water expandable sponge disposed in abutting relationship to said aperture in the interior of said canister, and a bracket for retaining said sponge against said aperture; and

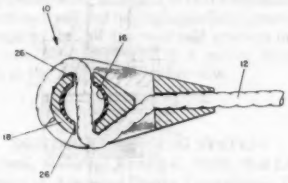
water activatable material for placement within said canister that evolves a gas when exposed to water.

4,540,371

SKI ROPE HANDLE ASSEMBLY

James H. Taylor, 601 Second Ave., Red Springs, N.C. 28377

Filed Jul. 25, 1983, Ser. No. 516,523
Int. Cl.³ B63B *21/56*
U.S. Cl. 441—69 **7 Claims**



1. A ski rope handle and rope assembly wherein the ski rope is coupled to each end of said handle through a double entry figure eight loop configuration, said ski rope handle and rope assembly comprising: an elongated ski rope handle having an elongated axis and a molded rubber-like surface; a finger protector sleeve formed about each end of said ski rope handle and extending therefrom and including a rope opening that extends therethrough at an angle normal to the elongated axis of said ski rope handle and a transverse opening extending therethrough adjacent to said rope handle and perpendicular to said rope opening wherein said rope opening extends into and terminates at said transverse opening; an opening formed through each end of said handle at an angle perpendicular to the rope opening formed in said finger protector sleeve and generally parallel with said transverse opening of said finger protector sleeve; a pair of rope segments that extend to and couple with opposite ends of said handle through a figure eight rope connection, each of said figure eight rope connections including a double rope entry through said opening formed within said handle so as to form side-by-side rope loops with one rope loop extending around a rear portion of said handle while the other rope loop extends around the forward portion of said handle and wherein said loops include a pair of rope segments that extends in side-by-side relationship through said opening within said handle; and wherein each said rope segment includes an end portion and an adjacent intermediate portion, said end portion being merged with said intermediate portion within said transverse opening prior to extending forwardly into said rope opening.

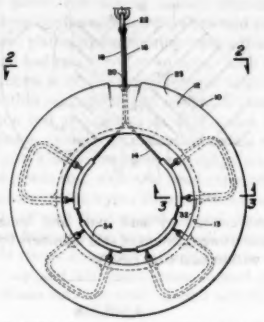
4,540,372

LIFE PRESERVER

Lee E. Mauck, 4020 S. 130th East Ave., Tulsa, Okla. 74134

Continuation-in-part of Ser. No. 407,803, Aug. 13, 1984, Pat. No. 4,464,132. This application Jun. 13, 1984, Ser. No. 620,061
Int. Cl.³ B63C *9/08*
U.S. Cl. 441—81 **6 Claims**

1. A life preserver comprising a buoyant toroidal body, yieldable means disposed within the body and accessible from the inner periphery of the body, strap means encircling the inner periphery of the toroidal body and operably secured to the yieldable means whereby the strap means is maintained in a normal position in the proximity of the inner periphery of the body, radially extending passageway means provided in the body and having the opposite ends open to the inner and outer peripheries of the toroidal body, the strap means having outer ends extending slidably through the passageway means and terminating exteriorly of the body, and means engagable with the outer ends of the strap means for selectively drawing the strap means radially inwardly against the force of the yieldable



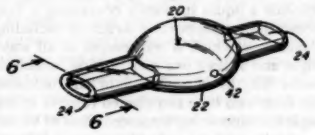
means for secure engagement with a victim disposed within the interior of said toroidal body.

4,540,373

METHOD OF FABRICATING AN ARC TUBE FOR AN ARC DISCHARGE LAMP

Harold L. Rothwell, Rowley, and George J. English, Reading, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 30, 1984, Ser. No. 645,649
Int. Cl.³ H01J *9/32*
U.S. Cl. 445—22 **6 Claims**



1. A method of fabricating an arc tube from a tubular blank, said blank having a circular cross section, said arc tube having an elongated body, a bulbous midsection hermetically enclosing an interior, and two opposed ends adjacent to said midsection, each of said ends having a press seal formed therein and electrode means mounted in said press seal, said electrode means protruding into said interior, and an electric arc generating and sustaining fill within said interior, said method comprising the steps of:

(a) heating said blank to pliability, forming said bulbous midsection in a portion of said blank, and preforming said ends in portions of said blank adjacent to said midsection, each of said preformed ends having a substantially elliptical cross section; then

(b) inserting said electrode means into each of said preformed ends such that said electrode means protrudes into said interior; then

(c) heating said preformed ends to pliability and forming press seals in each of said preformed ends thereby mounting said electrode means in each of said press seals; and then

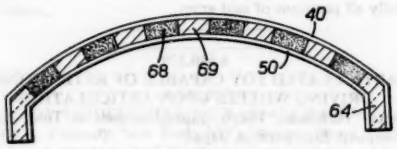
(d) filling said interior with said fill and thereafter hermetically sealing said midsection.

4,540,374

METHOD FOR MAKING CRT SHADOW MASKS

Eiji Kamohara, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 444,334, Nov. 24, 1982, abandoned. This application Jan. 31, 1985, Ser. No. 696,881
Claims priority, application Japan, Dec. 3, 1981, 56-193647
Int. Cl.³ H01J *9/14, 31/20*
U.S. Cl. 445—37 **8 Claims**



1. A method of making a mask structure for a cathode ray tube comprising the steps of:

preparing a first flat mask including an effective portion having a plurality of apertures therein and a non-effective portion surrounding said effective portion;

disposing a first spacer structure on said non-effective portion of said first mask and a second spacer structure on said effective portion of said first flat mask;

arranging a second flat mask on said first and second spacer structures, thereby forming a predetermined gap between said first and second flat masks, said second flat mask including an effective portion having a plurality of apertures therein and a non-effective portion surrounding said effective portion;

filling said apertures of said first and second flat masks and said gap with a filling material having a viscosity so as to be pourable;

solidifying said filling material, thereby fixing said flat masks together;

simultaneously pressing said fixed flat masks into a predetermined curvature; and

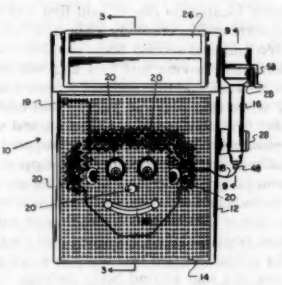
removing said second spacer structure from said curved masks.

4,540,375

GRAPHIC ARTS TOY

A. Edward Fogarty, and Bonnie R. Fogarty, both of 3513 School Ave., Sarasota, Fla. 33579

Filed Feb. 13, 1984, Ser. No. 579,674
Int. Cl.³ A63H *33/24, 33/30*
U.S. Cl. 446—146 **20 Claims**



11. A graphic arts toy, comprising:

a base;

a string retaining sketch pad, including a flexible, plate-like element having a plurality of upwardly extending, flexible fingers arrayed in equally spaced, parallel, transverse rows on the top thereof, said sketch pad being mounted on said base;

a string storage, dispensing and retracting pencil including a housing, a reel rotatably mounted in said housing, said reel having a crank handle positioned exterior to said housing, a string dispensing and retracting tube having one of its ends positioned in the interior of said housing and the other of its ends extending outward from said housing, and means for retaining said tube in said housing;

an elongated flexible string having one of its ends fastened to said reel and the other of its ends positioned external to said housing, said string being moveably positioned in the bore of said tube; and

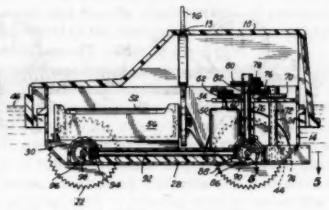
an anchor fastened to said end of said string positioned external to said housing.

4,540,376

AMPHIBIOUS TOY VEHICLE

Leslie Turbowitz, West Orange, N.J., and William Pipa, New Hyde Park, N.Y., assignors to Azrack-Hamway International, Inc., New York, N.Y.

Filed Mar. 28, 1984, Ser. No. 594,349
Int. Cl.³ A63H *23/04*
U.S. Cl. 446—164 **5 Claims**



1. A toy vehicle buoyant in water having a buoyant housing which is formed with an internal cavity, the level at which said vehicle floats in water defining a vehicle water line, a drive chamber formed in said housing which is isolated from said vehicle internal cavity and which is open to the exterior of said housing below said vehicle water line, said housing having no other openings below the vehicle water line, said drive chamber having at least one vertical riser extending above said vehicle water line to prevent water from flowing from said drive chamber into said internal cavity, a power shaft disposed within said vertical riser and extending above the uppermost portion of said vertical riser, water propulsion means drivingly connected to said power shaft at a point below said vehicle water line, transmission means drivingly connected to said power shaft above said vertical riser, electric motor means drivingly engaged with said transmission means, power source means electrically connected to said electric motor means, at least one of said electric motor means and said power source means positioned in said internal cavity below said vehicle water line and power switch means adapted to connect said power source means to said electric motor means so that said electric motor means will operate and correspondingly drive said water propulsion means.

4,540,377

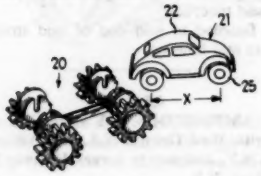
TOY VEHICLE CONVERSION ACCESSORY

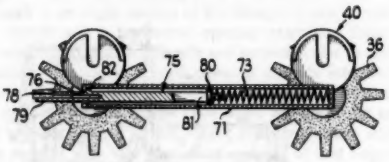
Steven F. Rehkemper, Chicago; Steven P. Hanson, Winnetka, and Harry Disko, S. Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 1, 1984, Ser. No. 575,790
Int. Cl.³ A63H *29/00, 17/05*
U.S. Cl. 446—430 **10 Claims**

7. A toy vehicle conversion accessory for a toy vehicle having relatively small wheels comprising:

an elongated frame member having opposed ends;
a pair of spaced apart transverse axles secured to the elongated central frame member adjacent each end;
a pair of relatively large wheels mounted for rotation on each of the axles;
mounting wells carried on the axle adjacent each of the relatively large wheels for releasably receiving the relatively small wheels of the toy vehicle to combine the toy vehicle with the accessory for movement therewith along a playing surface;





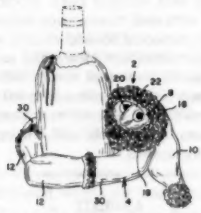
the elongated central frame member being hollow and having an opening at one end;
a compressible biasing means for propelling the combined toy vehicle and the accessory contained within the elongated frame member; and
an actuator for compressing and releasing the biasing means insertable into the hollow member with a trigger portion of the actuator protruding from the opening.

4,540,378

STUFFED FIGURE HAVING POSITIONABLE ARMS

Sharon I. Cusimano, 2537 W. 50th St., Chicago, Ill. 60632

Filed Nov. 29, 1984, Ser. No. 676,305
Int. Cl.³ A63H *3/02*
U.S. Cl. 446—369 **3 Claims**



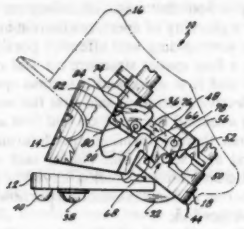
1. A stuffed figure comprising
a body having a continuous outer cloth covering and a soft filler material retained with the covering;
an elongated one piece arm structure having handlike designs attached at each end, said arm structure having a continuous outer cloth covering and a filler material retainer therein;
said arm structure having an end to end length at least three times greater than the greatest dimensional width of the body;
said arm structure being pivotally attached to said body at a midportion of said arm structure to form two freely swingable arms capable of assuming a multitude of positions;
said arm structure and said body each having a bottom portion lying generally in the same plane;
a head attached to an upper portion of said body; and
said arm structure and said body cooperating to maintain said body and said head in a generally upright position in substantially all positions of said arms.

4,540,379

ARTICULATED TOY CAPABLE OF RETRACTING DRIVING WHEELS UPON ARTICULATION

Tamotsu Tachibana, Tokyo, Japan, assignor to Tomy Kogyo Company, Incorporated, Japan

Filed Aug. 22, 1983, Ser. No. 524,870
Int. Cl.³ A63H *13/00, 11/00*
U.S. Cl. 446—448 **9 Claims**



1. A toy which comprises:
a body having a first body member and a second body member, said first and said second body members movably joined together so as to move between a first configuration and a second configuration with respect to each other;
said first body member including at least one first body member first support means and at least one first body member second support means, each of said first body member first and second support means located on said first body member and each for supporting said first body member on a support surface;
said second body member including at least one second body member first support means located on said second body member for supporting said second body member on a support surface;
moving means located on one of said first and said second body members and operatively associated with the other of said first and said second body members, said moving means being for moving said first and said second body members between said first and said second configurations whereby when said first and said second body members are in said first configuration said first and said second body members are supported on said support surface by contact of said first body member first support means and said second body member first support means against said support surface and when said first and said second body members are in said second configuration said first and said second body members are supported on said support surface by contact of said first body member second support means and said second body member first support means against said support surface;
said first body member first support means comprising at least one driving wheel rotatably mounted on said first body member;
said moving means includes a motor means, said driving wheel being operatively connected to said motor means so as to be rotated by said motor means;

said driving wheel being located on said first body member in a position to contact said support surface when said first and said second body members are in said first configuration so as to propel said body over said support surface;

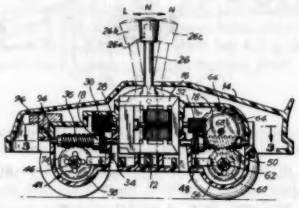
said first body member second support means being located on said first body member in a position in association with said driving wheel so as to lift said driving wheel upwardly from said support surface disrupting the contact of said driving wheel and said support surface when said first and said second body members are in said second configuration.

4,540,380

TOY VEHICLE HAVING VARIABLE DRIVE

Melvin R. Kennedy, New York, N.Y.; Dietmar Nagel, Chester, N.J., and Abraham Arad, Westport, Conn., assignors to Nagel, Kennedy, Arad & Associates, New York, N.Y.

Filed Mar. 13, 1984, Ser. No. 588,968
Int. Cl.³ A63H *29/24*
U.S. Cl. 446—463 **7 Claims**



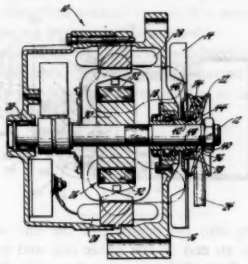
1. A miniature toy vehicle comprising a chassis, a first axle rotably mounted to said chassis, á first pair of wheels installed on said first axle, a second axle rotably mounted to said chassis, a second pair of wheels installed on said second axle, a motor means mounted to said chassis, a transmission means mounted to said chassis and drivingly connected to said motor means and an activating means mounted to said chassis, said transmission comprising a first low speed gear rotably mounted on said first axle, a first clutch means, mounted on said first axle and selectively engaging said first low speed gear with said first axle, a second low speed gear rotably mounted on said second axle, a drive gear installed on said second axle, a second clutch means mounted on said second axle and selectively engaging said second low speed gear with said drive gear, a first spur gear drivingly engaged with said motor means, a first worm co-axially mounted with said first spur gear and drivingly connected to said first low speed gear, a second spur gear drivingly engaged with said motor means, a second worm co-axially mounted with said second spur gear and drivingly engaged with said second low speed gear, an intermediate gear selectively engaged with said second low speed gear, a high speed gear interconnected with said intermediate gear and continuously engaged with said drive gear, and shifting means connected to said first and second low speed gears and adapted to selectively engage and disengage said first and second clutch means; said transmission having a first configuration wherein said shifting means is positioned to cause said first clutch means and said second clutch means to be engaged for four-wheel drive operation; and a second configuration wherein said shifting means is positioned to cause said first clutch means to be disengaged allowing said first pair of wheels to free-wheel and to cause said second clutch means to be disengaged while urging said second low speed gear into engagement with said intermediate gear to drive said second pair of wheels at high speed.

4,540,381

SELECTIVELY OPERABLE ROTARY DRIVE MEANS

Edward W. Molloy, Port Clinton, and Ronald E. Shafer, Milan, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1984, Ser. No. 643,689
Int. Cl.³ F16D *27/00*; F16H *37/06, 15/08*; H02K *9/06*
U.S. Cl. 464—29 **3 Claims**



1. A selectively operable drive means for driving an at least partially ferrous metal cooling fan by a rotary axial shaft of a power source that has the characteristic of producing waste heat proportional to the strength of a magnetic field produced by the power source, comprising,

a rolling element bearing having an outer race mounting the cooling fan within the magnetic field, whereby the magnetic field may act on the cooling fan to pull said portion and the outer race axially toward the power source, an inner race mounted to rotate with the shaft, and a complement of rolling elements disposed between pathways of the races, said rolling elements and pathways engaging one another with a relative configuration that is sufficiently conforming that the races will, when the magnetic field is relatively weak, axially align relative to one another as the pathways seek to center on the rolling elements to a relatively low cooling position with reduced friction between the rolling elements and the pathways and consequent slippage of the fan and outer race relative to the shaft when less heat is generated,

said relative configuration of the rolling elements and pathways also being sufficiently divergent that the races will axially misalign to a relatively high cooling position when a relatively stronger magnetic field acts on the ferrous portion of the fan to, in turn, wedge the rolling elements more tightly between the pathways to transmit more turning force from the inner race, through the rolling elements, and to the outer race and cooling fan to give consequently less slippage, and consequently greater fan speed and cooling, when more waste heat is generated.

4,540,382

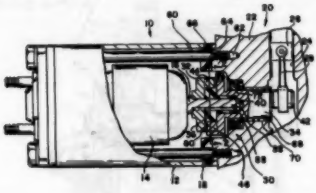
NOISE REDUCTION COUPLING DEVICE FOR AN ELECTRIC MOTOR PUMP

Robert K. Wilson, Granger, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Oct. 28, 1983, Ser. No. 546,259
Int. Cl.³ F04B *17/00*; F16D *3/68*
U.S. Cl. 464—73 **4 Claims**

1. In a noise-reduction coupling device for an electric pump motor, an input member and an output member, the input member rotatable about an axis to impart rotation to the output member, one of the members defining an opening receiving a guide rod formed by the other member, both of the members including axially extending projections forming a plurality of edges facing each other and spaced-apart from each other in the direction of rotation, both of the members cooperating to define a cavity therebetween which is open to the spacings between the facing edges, and a resilient member disposed

within the cavity and extending into the spacings to maintain the edges spaced apart from each other and to transmit rotation of the input member to the output member so that noise generating vibrations between the input member and output member are absorbed by the resilient member, the resilient member extensions into the spacings each having an axial length greater than an axial length of any axially extending projection to prevent any projection from engaging the opposite input or output member, the resilient member including a cylindrical



portion extending into the opening of the one member to a position adjacent an end of the guide rod and engaging the guide rod and surface of the opening to resiliently isolate the guide rod from the one member and effectively prevent noise-generating vibrations from being transmitted between the guide rod and one member, the one member comprising an eccentric drive shaft with an offset post and one of the axially extending projections of the one member being larger than the remainer of the axially extending projections of the one member in order to define a counterbalance for the offset post.

4,540,383

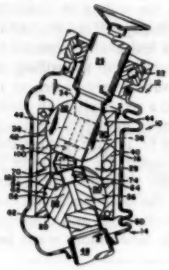
CENTERING DEVICE FOR A CONSTANT VELOCITY JOINT

Alistair G. Taig, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 15, 1984, Ser. No. 589,924

Int. Cl.³ F16D *3/20*

U.S. Cl. 464—110 **20 Claims**



1. In a universal joint, a housing having a pair of openings for receiving an input shaft assembly and an output shaft assembly, said input shaft assembly being rotatable to inpart rotation to said housing and to said output shaft assembly, said input and output shaft assemblies each terminating in a cylindrical end having a longitudinal axis extending substantially normal to the respective shaft assembly, the housing defining a first pair of arcuate surfaces engageable with the cylindrical end of said input shaft assembly and a second pair of arcuate surfaces engageable with the cylindrical end of said output shaft assembly, said housing rotating with the input and output shaft assemblies to provide for sliding engagement between said cylindrical ends and their respective arcuate surfaces when said input shaft assembly imparts rotation to said housing and output shaft assembly, and a pilot assembly disposed between the cylindrical ends, characterized in that said pilot assembly comprises a first pilot member and a second pilot member each engaging its respective shaft assembly, the first pilot member having an angled face engaging a complementary-shaped angled face of said second pilot member, the angled faces elliptically shaped and in face-to-face engagement across the surfaces of the faces, and pin means extending between said pilot members so that the respective longitudinal center lines of said first and second pilot members and pin means intersect at the same point.

4,540,384

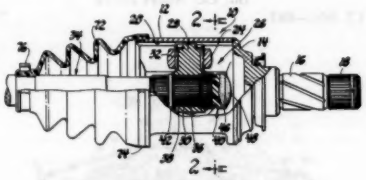
TRIPOT JOINT WITH SPIDER RETAINING SHAFT BUMPER ASSEMBLY

Jack L. Bennett, Reese; Wayne E. Wardynski, Bay City, and Kenneth J. Seyuin, Pinconning, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 2, 1984, Ser. No. 606,262

Int. Cl.³ F16D *3/20, 3/30*

U.S. Cl. 464—111 **3 Claims**



1. A universal joint having a centralized inner drive shaft terminating in an externally splined end portion and an end face, a retainer groove formed in said splined end portion adjacent to said end face, a spider assembly having a hub drivingly mounted on said splined end portion adjacent to said end face, said hub having recess means therein spaced outwardly from the outer periphery of said splined end portion, said hub further having a plurality of radially extending drive elements operatively mounted thereon, an outer housing disposed around said drive elements, a plurality of arcuately spaced drive channels formed in said housing, said drive elements being operatively mounted in said drive channels so that said drive shaft can be pivoted and linearly moved within said housing, the improvement comprising a bumper assembly for said inner drive shaft, said bumper assembly including a bumper pad of resilient material adapted to be secured to the end of said drive shaft and a pair of curved clamps, said bumper pad having a retainer groove formed in the periphery thereof, each of said clamps having inwardly extending retainer portions at opposite ends thereof respectively received in the retainer grooves in the end of said shaft and in said bumper pad to secure said bumper pad adjacent to the end face of said drive shaft, said recess means of said hub providing radial wall means to peripherally contact said curved clamps to secure said clamps to the end portion of said drive shaft.

4,540,385

DRIVE SHAFT ASSEMBLY

Werner Krude, Siegburg, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Oct. 21, 1983, Ser. No. 544,460

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239075

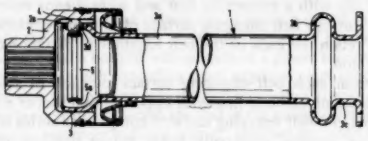
Int. Cl.³ F16D *3/26;* **F16C** *1/02*

U.S. Cl. 464—113 **10 Claims**

1. A drive shaft assembly particularly for use for driving the wheels of a motor vehicle comprising a first universal joint, a second universal joint and an intermediate shaft interconnecting said two universal joints, said intermediate shaft being made exclusively of fiber reinforced plastic material and being

structured integrally with a component of at least one of said universal joints, at least one of said universal joints consisting essentially of an outwardly extending fold formed in said intermediate shaft, said fold extending integrally with a connecting part adapted to enable said intermediate shaft to be joined with a driving member, said fold being formed with a diameter which is larger than the diameter of said intermediate shaft.

2. A drive shaft assembly particularly for use for driving the wheels of a motor vehicle comprising a first universal joint, a



second universal joint and an intermediate shaft interconnecting said two universal joints, said intermediate shaft being made exclusively of fiber reinforced plastic material and being structured integrally with a component of at least one of said universal joints, at least one of said universal joints being a constant velocity ratio joint having a member which is formed integrally with said intermediate shaft, said integrally formed member having a diameter which is considerably larger than the diameter of said intermediate shaft but being formed with the same wall thickness as said intermediate shaft.

4,540,386

AXIAL SECURING DEVICE FOR UNIVERSAL JOINT ASSEMBLY

Klaus Kämpf, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,660

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305789

Int. Cl.³ F16D *3/26*

U.S. Cl. 464—130 **1 Claim**

1. An axial securing device for a universal joint assembly, comprising:

a yoke arm with an internal cylindrical wall defining a yoke eye, said yoke eye having an interior end and an exterior end taken relative to said universal joint assembly;

a needle bearing bush for receiving a crosspiece of a joint cross member arranged within said yoke eye and circumferentially surrounded by said cylindrical wall, said needle bearing bush having a bottom end wall located adjacent said exterior end of said yoke eye;

an annular groove provided in said yoke arm extending circumferentially about said yoke eye and radially outwardly from said internal cylindrical wall, said annular groove having a radially innermost end contiguous with said cylindrical wall opening into said yoke eye proximate said exterior end thereof, said groove being defined between a pair of annular walls one of which is located closer to said exterior end of said yoke eye than the other;

an annular securing ring extending circumferentially relative to said yoke eye and having a first annular wall facing toward said exterior end of said yoke eye engaged against said one annular wall of said annular groove and a second annular wall facing towards said interior end of said yoke eye engaged against said bottom end wall of said bearing bush to axially secure said bearing bush within said yoke eye and prevent movement thereof toward said exterior end of said yoke eye;

said securing ring being formed with a wedge-shaped cross sectional configuration, with said first and second annular walls thereof tapering toward a norrowing configuration radially outwardly from said yoke eye;

said one annular wall of said annular groove extending in an angular direction parallel to said first annular wall of said securing ring engaged thereagainst;

said bottom wall of said bearing bush having a conical annular portion abutting against said second annular wall of said securing ring and extending in an angular direction parallel thereto.

4,540,387

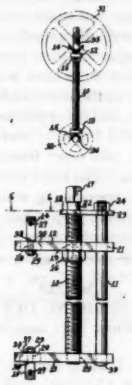
APPARATUS FOR ADJUSTING THE SPACING BETWEEN SHEAVES

Jose G. Epino, 3316 Park St., Jacksonville, Fla. 32205

Filed Feb. 29, 1984, Ser. No. 584,783

Int. Cl.³ F16H *7/08*

U.S. Cl. 474—136 **12 Claims**



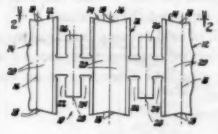
1. An apparatus for applying force to increase the spacing between two cooperating sheaves comprising an elongated threaded rod having an upper journal section and a lower journal section with a wrench receiving head extending beyond said upper journal section, a stationary transverse support arm having a recess to receive said lower journal section, a travelling transverse support arm having a threaded hole mated with said elongated threaded rod, a nonthreaded guide rod spaced from and positioned parallel to said elongated threaded rod and being affixed to said stationary arm and slidingly engaged in a hole in said travelling arm, a connecting spacer clamped to the end of said nonthreaded rod adjacent the head of said threaded rod and a hole for receiving said upper journal section, each of said arms having adjustably affixed thereto a receptacle adapted to receive a portion of a sheave, the two receptacles being aligned with each other parallel to said threaded arm and directed away from each other.

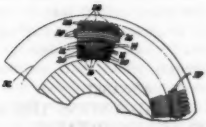
4,540,388

V-BELT STRUCTURE

Roy S. Cataldo, Birmingham, and Arlis Hall, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 29, 1984, Ser. No. 614,660
Int. Cl.[3] F16G 5/00
U.S. Cl. 474—242 2 Claims





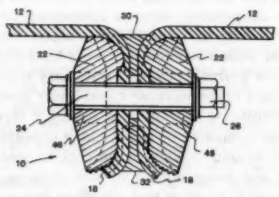
1. A push-type metal V-belt adapted to operate on V-grooved pulleys and cooperating therewith to establish a pitch diameter comprising; a single metal strip fan-folded to provide outer folded edges, inner folded edges, and drive block portions between said inner and outer folded edges, said inner folded edges being formed with a smaller radius than said outer folded edges so that adjacent drive portions which are connected at an outer folded edge have a tapered configuration from the pitch diameter to the inner folded edge when viewed in a longitudinal section, said drive portions having converging side surfaces when viewed laterally; lateral slots formed in said drive portions between said outer folded edge and the pitch diameter; and continuous metal band members disposed in said lateral slots and being operable to maintain said fan-folded metal strip in a continuous loop when said metal V-belt is operated with the V-grooved pulleys.

4,540,389

BELT SPLICING DEVICE

Earl A. Ramsey, Carrollton, Tex., assignor to Maxi-Lift, Inc., Dallas, Tex.

Filed Apr. 1, 1983, Ser. No. 481,363
Int. Cl.[3] F16G 3/08
U.S. Cl. 474—257 3 Claims



1. A device for splicing ends of a belt together in juxtaposed relation, comprising:

(a) a generally elongate spacer element having

(1) a generally planar central section and

(2) first and second ends adjacent respective opposite edges thereof, each of said first and second ends having two oppositely outwardly curving belt engaging surfaces;

wherein each belt engaging surface of said spacer element first end comprises a series of adjacent, parallel essentially linear ridges defining parallel valleys therebetween;

(b) a pair of belt clamping elements, each having

(1) a generally planar central section, and

(2) first and second ends adjacent respective opposite edges thereof, each of said first and second ends having an inwardly curving belt engaging surface for cooperating with a respective first and second ends outwardly curving belt engaging surface of said spacer element to retain the ends of the belt together in juxtaposed relation;

wherein each belt engaging surface of each of said belt clamping element first ends opposing said spacer element first end belt engaging surfaces comprises a series of adjacent, parallel essentially linear ridges defining parallel valleys therebetween;

wherein said linear ridges of said belt clamping element first end engaging surfaces are transverse to said linear ridges of said spacer element first end belt engaging surfaces; and,

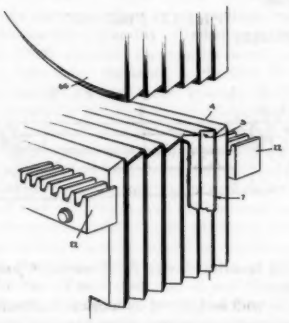
(c) clamp retaining means for drawing said belt clamping elements toward one another to clamp the ends of the belt together against said elongate spacer element.

4,540,390

METHOD AND APPARATUS FOR FORMING NOTCHES FOR GUSSETS FOR EXPANDABLE ENVELOPES

Donald Thorschmidt, Hicksville, N.Y., assignor to Acebee Manufacturing Co., Clifton, N.J., a part interest

Filed Jul. 25, 1983, Ser. No. 517,010
Int. Cl.[3] B31B 31/02, 31/26, 1/28
U.S. Cl. 493—23 19 Claims



1. Apparatus for folding and notching a pleated gusset member to form the end walls and the bottom wall of an expandable envelope comprising:

a frame,

a table mounted to said frame having a ridged upper surface of crests and grooves adapted to receive the pleats of the bottom wall portion of a gusset member when the gusset member is disposed thereon with an end wall portion projecting beyond an end portion of the table extending transversely to the crests and grooves of the ridged surface, the table having a ridged side surface of crests and grooves intersecting the ridged upper surface with the respective crests and grooves in alignment with one another,

means mounted to said frame for pressing the pleats of the bottom wall portion of the gusset member into the grooves of the ridged upper surface of the table, the pressing means including an iron having a ridged lower surface

of crests and grooves adapted to nest with respect to the ridged upper surface of the table to press the pleats of the bottom wall portion of the gusset member into the ridged upper surface of the table, the iron further having a vertical side wall intersecting the ridged lower surface, the vertical side wall being chamfered adjacent the intersection with the ridged lower surface to accommodate the entry of the notches during the formation thereof,

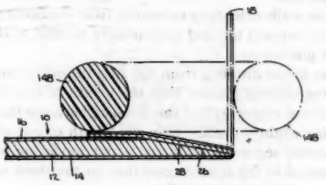
means mounted to said frame for urging the pleats of the end wall portion of the gusset member against the ridged side surface of the table adjacent the intersection of the ridged side surface and the ridged upper surface of the table to fold the gusset member at the intersection of an end wall portion and a bottom wall portion of a gusset member and to form a notch extending from adjacent each groove of the end wall portion into the corresponding groove of the bottom portion adjacent the fold in the gusset member, the urging means including a support member mounted to said frame and at least one pressing roll pivotally mounted to said support member for rolling with respect to the grooves of the vertical side of the table to urge the pleats of the end wall portion into the ridged side surface of the table, the urging means further including means for moving the pressing roll upwardly in a rolling engagement with the end wall portion of the gusset member to adjacent the intersection of the upper ridged surface and the ridged side surface of the table to fold the end wall portion of the gusset member and to form the notches adjacent to the fold.

4,540,391

METHOD AND APPARATUS FOR SKIVING AND HEMMING

Carl J. Fries, Jr., Holland, Pa., assignor to International Paper Company, New York, N.Y.

Filed Dec. 6, 1982, Ser. No. 447,104
Int. Cl.³ B31C *11/02*
U.S. Cl. 493—287 **24 Claims**



3. A method for skiving and hemming a piece of sheet material having a paperboard layer and having at least one surface layer of heat sealable material constituting at least one region of one surface of said piece of material, said method comprising the steps of:

cutting into said paperboard layer and removing a portion of said paperboard layer together with any overlying portion of said layer of heat sealable material, to define an oblique cut plane inclined at an angle to the plane of said layer of heat sealable material, and cutting into said paperboard layer and removing a portion of said paperboard layer together with any overlying portion of said layer of heat sealable material, to define a flat cut surface along an edge of said sheet material substantially parallel to said layer of heat sealable material, to define a flap generally parallel to an edge of said piece of material; and

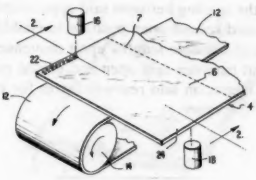
folding said flap along a line generally parallel to said edge of said piece of material and lying between said oblique cut plane and said flat cut surface, to bring a portion of said flat cut surface into contact with said oblique cut plane and another portion of said flat cut surface into contact with said layer of heat sealable material and pressing said flap against said layer of heat sealable material under conditions effective to make a seal therebetween, thereby to define a wedge-shaped edge portion.

4,540,392

METHOD AND APPARATUS TO SEAL COATED PAPERBOARD MATERIALS

John E. Junod, Philadelphia, Pa., and Barry P. Fairand, Columbus, Ohio, assignors to International Paper Company, New York, N.Y.

Filed Dec. 23, 1983, Ser. No. 564,957
Int. Cl.³ B31C *3/00*
U.S. Cl. 493—303 **14 Claims**



1. A method of making a tubular member from a substrate member of foldable, stiff and resilient material such as paperboard or the like, said substrate member being coated on its surfaces with a heat softenable and rehardenable thermoplastic material, the method including:

(a) heating at least one edge of the member that is to be joined to thereby soften the coated thermoplastic material at said edge to form a bondable seam surface,

(b) overlapping opposite edges of the member to present said heated seam surface in opposing relation,

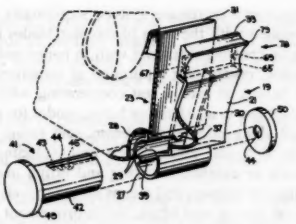
(c) subjecting said overlapping edges of the member to pressure to form a seam, said heating step being carried out by subjecting at least one edge of the member with energy from a laser over an area of a width substantially equal to the width of seam, prior to opposite edge surfaces being placed in surface contact with each other, said heating rendering said at least one seam surface soft and tacky.

4,540,393

VARIABLE LENGTH TAB-FORMING DEVICE FOR TAPE ROLL HOLDERS

Jack P. Knoop, 326 Avenida Arboles, San Jose, Calif. 95123

Continuation-in-part of Ser. No. 294,533, Aug. 20, 1981, Pat. No. 4,437,854. This application Oct. 3, 1983, Ser. No. 538,230
Int. Cl.³ B26F *3/02*
U.S. Cl. 493—353 **19 Claims**



1. A molded polymer tab forming device for attachment to a tape dispenser comprising,

(a) a pair of upwardly extending forward and rearward struts, having lower and upper extremities,

(b) a flexible spring comprising a cylinder having a lateral

slot with front and back edges, said lower extremities of the forward and rearward struts joined respectively to said front and back edges of said slot, said struts being biased by said spring to diverge upwardly at the upper extremities, forming a spaced open position, the upper extremities of the struts each terminating in a wing, the wing of the forward strut having a forward extending tear-off section, the two wings abutting when said forward strut is pushed against said rearward strut, thereby defining a closed position, said wings forming tape tabs by movement of the struts between open and closed positions,

(c) means for varying the diameter of said cylinder and altering the spacing between said upper extremities of said struts in said spaced open position to enable formation of tape tabs of variable lengths upon movement of said forward strut between said open and closed positions, and

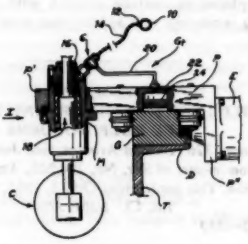
(d) anchor means on said rearward strut for rapid coupling to a tape dispenser.

4,540,394

LOCK AND/OR RELEASE SYSTEMS, ASSOCIATED IN STRUCTURE AND OPERATION TO THE RESTS OF CIRCULAR BLADES OR CREASERS, FOR CUTTERS OR CREASING MACHINES TO BE USED INDUSTRIALLY IN THE FIELD OF THE PAPER AND CARDBOARD MANUFACTURING

Elio Cavagna, S. Zenone al Lambro, Italy, assignor to Elio Cavagna S.R.L., S. Zenone al Lambro, Italy

Filed Feb. 1, 1983, Ser. No. 462,880
Claims priority, application Italy, Feb. 4, 1982, 19461 A/82
Int. Cl.³ B31F *1/08*
U.S. Cl. 493—365 **15 Claims**



1. In a lock and/or release system, structurally and operatively associated with the rests of circular blades or creasers, for cutting or creasing machines used in paper and cardboard manufacturing, comprising a plurality of structural operative units each having at least a rest cooperating with means for sliding and for traverse, a bearing beam, guides for the traverse of each unit along said bearing beam, said means for sliding cooperating with said guides, each unit including at least a circular blade or creaser, lowering and lifting means for the circular blade or creaser, and means for selectively locking or releasing said rest on said beam, the improvement comprising means for synchronizing the lowering and lifting means for the circular blade or creaser and the means for selectively locking or releasing said rest on said beam so that simultaneously with the lowering of said circular blade or creaser said rest locks with respect to said beam and simultaneously with the raising of said circular blade or creaser said rest releases with respect to said beam.

4,540,395

REFOLDING AND STACKING RECEPTACLE FOR SEGMENTED SHEET MATERIAL

Jan T. Bekooy, 7670 SW. Barnard Dr., Beaverton, Oreg. 97007

Filed Feb. 11, 1983, Ser. No. 465,878
Int. Cl.³ B65H *45/06*
U.S. Cl. 493—410 **5 Claims**

1. A refolding and stacking receptacle for receiving a web of linearly-moving, reversely-foldable, segmented sheet material comprising:

(a) a base member having a bottom support end and a substantially horizontal sheet support top end for supporting a stack of the material in flat-folded condition,

(b) a substantially vertical guideway positioned centrally of the sheet support top end and extending downwardly therefrom for receiving the leading end of the moving web fed to the receptacle in unfolded condition, the upper end portion of the guideway being flared outwardly at its interception with the horizontal top end while retaining a major portion of the horizontal top end for supporting sheet material thereon,

(c) stop means in the guideway below the sheet support top end for arresting the downward linear movement of the web, and

(d) side walls extending upwardly from the outer ends of the sheet support top end substantially parallel to the plane of the guideway,

(e) the linear distance from the stop means to one side wall being slightly greater than the length of one of the sheet material segments and the distance between the side walls being slightly greater than the length of one of the sheet material segments, to insure accommodation of the sheet material in flat-folded condition on the sheet support top end within the side walls.

4,540,396

APPARATUS FOR FOLDING PAPER SACKS TO Z SHAPE

Ernst R. Berthelsen, Terndrup, Denmark, assignor to Bates Ventilsakke Co. A/S, Norresundby, Denmark and Windmoller & Holscher, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,875
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3215006
Int. Cl.³ B65H *45/22*
U.S. Cl. 493—447 **12 Claims**

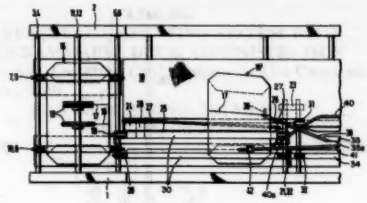
1. Apparatus for folding an essentially planar article to a Z-shaped configuration, which comprises:

conveying means for conveying the essentially planar article along a predetermined path;

first folding means mounted adjacent the conveying means for folding a first portion of the essentially planar article in a first direction along a first fold line as the article is conveyed along the predetermined path by the conveying means; and

second folding means mounted adjacent the conveying means for folding a second portion of the essentially pla-

nar article in a second opposite direction along a second fold line, which is spaced from the first fold line, as the



article is conveyed along the predetermined path by the conveying means.

4,540,397

CENTRIFUGAL APPARATUS

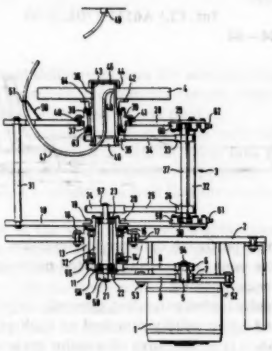
Houshang Lolachi, Rockville, Md.; Bernd Mathieu, and Wolfram Weber, both of Spiesen-Elversberg, Fed. Rep. of Germany, assignors to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 553,297

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1982, 3242541

Int. Cl.³ B04B *9/08, 11/00*

U.S. Cl. 494—84 **17 Claims**



1. A centrifugal apparatus comprising

a processing chamber assembly,

a flexible cable or tube permanently connected between a stationary terminal and said processing chamber assembly,

a loop formed by said cable or tube, said cable or tube being connected to said processing chamber assembly on the side thereof opposite to said stationary terminal, and being guided around the outer periphery of said processing chamber assembly,

a drive train for driving said processing chamber assembly at a determined rotational speed,

a loop guide assembly for said loop of said cable or tube being capable of revolving, or orbiting, said loop at half the rotational speed and in the same rotational direction as said processing chamber assembly, said processing chamber assembly being rotatably mounted on said loop guide assembly,

characterized in that

there is provided a first drive shaft for a drive train driving said loop guide assembly, and

there is provided a second drive shaft for said drive train driving said processing chamber assembly,

said first and second drive shafts each being drivingly connected to a driving shaft of a motor drive unit mounted on a stationary supporting structure.

4,540,398

KNITTED SURGICAL SWABS

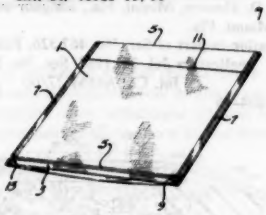
Craig Barson, Skipton, England, and Thomas Denny, East Brunswick, N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Jul. 1, 1983, Ser. No. 510,110

Claims priority, application United Kingdom, Mar. 29, 1983, 8308674

Int. Cl.³ A61F *13/00*

U.S. Cl. 604—1 **7 Claims**



1. A surgical swab comprising a warp knitted body portion and an integrally warp knitted handling tape, said body portion being joined to said handling tape by means of a joining region consisting of yarns which are knitted into the fabric of the body portion and the handling tape where required to effect said join.

4,540,399

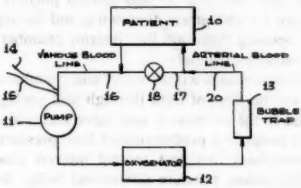
EMERGENCY BYPASS SYSTEM

Ken Litzie, 21055 Glenbrook Dr., Walnut, Calif. 91789, and Craig P. Roberts, 850 A Loma Dr., Hermosa Beach, Calif. 90254

Filed Feb. 1, 1983, Ser. No. 463,057

Int. Cl.³ A61M *1/03*

U.S. Cl. 607—4 **7 Claims**



1. In a simplified general purpose emergency bypass system having a cardiopulmonary support apparatus withdrawing venous blood from a patient and for patient arterial return thereof, the improvement which consists solely of the combination of:

a closed circuit of components arranged in a series relationship between the patient's venous blood supply and arterial blood return, said circuit having a static extracorporeal fluid volume;

said circuit components consisting of a non-occlusive blood pump, an oxygenator, and interconnecting static extracorporeal volume means providing continuous fluid communication between said components, and said circuit including bubble trapping means;

a venous cannula;

an arterial cannula;

said interconnecting means operably coupled to said venous cannula for withdrawing venous blood into one end of

said circuit, and to said arterial cannula at the other end of said circuit for returning blood to the patient; and

said closed circuit including a bypass loop selectively coupling said interconnecting means together between said cannulae for priming and air purging purposes in said circuit.

4,540,400

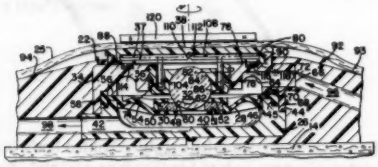
NON-INVASIVELY ADJUSTABLE VALVE

Michael D. Hooven, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 467,326, Feb. 17, 1983,. This application Jul. 21, 1983, Ser. No. 515,700

Int. Cl.³ A61M *27/00*

U.S. Cl. 604—9 **15 Claims**



1. A valve for regulating the passage of body fluids from one location in the body to another location, comprising:

a housing;

means including a flexible diaphragm within said housing for dividing the interior thereof into first and second interior chambers, said diaphragm including a central portion having a position within said diaphragm dependent on the fluid pressure differential between said chambers;

an inlet port for admitting fluid from said one location into said first interior chamber;

a discharge port for discharging fluid from said second interior chamber to said another location;

a valve seat mounted on said central portion of said diaphragm for movement therewith, and having a passageway opening from said first interior chamber to said second interior chamber;

valve closure means within one of said chambers arranged to restrict the flow of fluid through said passageway in response to the position of said valve seat within said housing to maintain a predetermined fluid pressure differential between said first and second interior chambers, said predetermined pressure differential being dependent on the position of said valve closure means within said housing; and

adjusting means responsive to an externally applied magnetic field for adjusting the position of said valve closure means within said housing to vary said predetermined pressure differential.

4,540,401

IN VIVO THERAPEUTIC APHERESIS USING LIPID VESICLES

James F. Marten, Cohasset, Mass., assignor to Applied Immune Sciences, Inc., Holmdel, N.J.

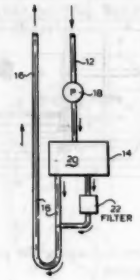
Filed Feb. 22, 1983, Ser. No. 468,158

Int. Cl.³ A61M *31/00*

U.S. Cl. 604—28 **1 Claim**

1. A method of removing an immunologically reactive compound from the blood of a living mammal, which comprises;

introducing into the blood in a living mammal an immunological homolog of said compound, bound to the surface of a lipid vesicle, in the blood, whereby the bound homolog and the compound mix and react to form a complex; and



separating the resulting complex from the blood plasma.

4,540,402

DOUBLE PERFUSION CATHETER

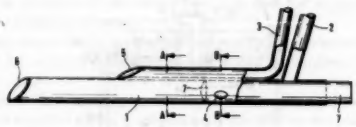
Karl Aigner, Uhlandstr. 5, 6301 Pohlheim, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,680

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214397

Int. Cl.³ A61M *1/03, 5/00*

U.S. Cl. 604—44 **10 Claims**



1. A double perfusion catheter for insertion, over its entire length, in the vena cava during isolated perfusion of the liver, said catheter comprising

two individual tubes extending generally in parallel relationship and being solidly attached to each other, namely a first tube (1) in the form of a splint catheter tube, and a second tube (3) carried by, and having a shorter length and a smaller diameter than, said first tube (1),

said first tube (1) having a rear opening, a shunt tube (2) laterally branching off from said first tube (1) at a point spaced forwardly from said rear opening, a tapered front opening (6), and at least one lateral opening (4) on the side of said first tube (1) generally opposite the side on which said second tube (3) is carried,

said second tube (3) having a tapered front opening (5) at a point rearwardly of the front opening of said first tube (1), and having a rear portion which is open at its end and extends laterally away from the first-mentioned side of said first tube (1), and

said lateral opening(s) (4) in said first tube (1) being located at a distance of from 40 to 60 mm from the center of the point of junction of said shunt tube (2) with said first tube (1),

such that upon full insertion of said catheter into the vena cava during isolated perfusion of the liver, isolated withdrawal of blood from the liver through said second tube (3) in a rearward direction is made possible while, at the same time, circulation of blood, from said shunt tube (2) as well as from said lateral opening(s) (4), and thence

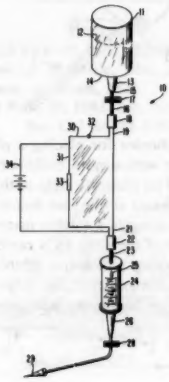
through said first tube (1) in a forward direction remains insured.

4,540,403

PARENTERAL DISPENSING SYSTEM WITH PROGRAMMABLE DRUG ADMINISTRATION

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Jul. 2, 1984, Ser. No. 626,908
Int. Cl.³ A61M 5/14
U.S. Cl. 604—85 **30 Claims**



1. A parenteral delivery system for administering a beneficial agent to a recipient, the delivery system comprising:

I. a reservoir of a pharmaceutical fluid,

II. an electrotransport apparatus for use with the parenteral system for admitting a beneficial agent into the pharmaceutical fluid, the electrotransport apparatus comprising:

(a) a housing comprising a wall that surrounds an internal space;

(b) means in the wall for (1) releasably connecting the electrotransport apparatus to the parenteral system, for (2) letting pharmaceutical fluid flow from the parenteral system with the electrotransport apparatus, and for (3) letting pharmaceutical fluid exit the electrotransport apparatus and reenter the parenteral system;

(c) a pair of electrodes in spaced relation disposed within the electrotransport apparatus;

(d) a cation exchange membrane interposed between the electrodes; and,

(e) a beneficial agent in the housing initially present between an electrode and the cation exchange membrane.

4,540,404

BALLOON CATHETER WITH INTRINSIC INTRODUCER FOR PERCUTANEOUS INSERTION INTO A BLOOD VESSEL OVER A GUIDE WIRE, AND METHOD OF USE

Sidney Wolvek, Brooklyn, N.Y., assignor to Datascope Corp., Oakland, N.J.

Filed Jan. 19, 1983, Ser. No. 459,117
Int. Cl.³ A61M 25/00
U.S. Cl. 604—96 **7 Claims**

1. A balloon catheter comprising

a tip having a tapered distal end,

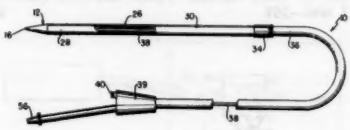
a central lumen extending longitudinally of said catheter,

a balloon membrane coaxial with and surrounding said central lumen and having its distal end connected to said tip,

a sheath slidable over said balloon to form an assembly,

a guide wire slidable through said central lumen and insertable into a blood vessel for guiding said tip, membrane and sheath to a location within said blood vessel selected for therapy,

said sheath fitting loosely over said balloon, whereby said sheath can be withdrawn along the balloon catheter to expose said balloon at said location and said balloon can then be inflated to provide therapy, and



wrapping means connected to said central lumen whereby said central lumen is rotatable about its axis to unwrap said balloon membrane after withdrawal of said sheath to facilitate deployment of said balloon at said location.

4,540,405

DISPOSABLE SYRINGE SLEEVE

Gabriel M. Miller; Timothy B. Cowen, both of Barboursville, and Philip R. Palin, Huntington, all of W. Va., assignors to Cilco, Inc., Huntington, W. Va.

Filed Jul. 12, 1983, Ser. No. 512,921
Int. Cl.³ A61M 5/26
U.S. Cl. 604—232 **9 Claims**

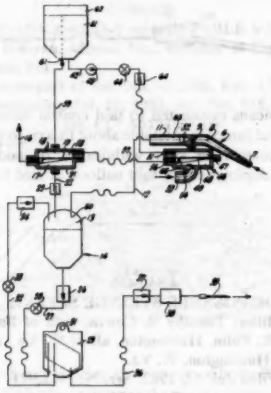
1. An apparatus for use with a hypodermic syringe having a syringe body with a tip extending directly therefrom and a hypodermic needle shaped to fit over the tip, the hypodermic needle having external threads formed thereon, said apparatus comprising a sleeve means for receiving the hypodermic syringe, said sleeve means including a hollow sleeve member into which the syringe body is inserted, saod hollow sleeve member having a cross-sectional shape adapted to fit the cross-sectional shape of the syringe body, said hollow sleeve member also having a hollow threaded section disposed at one end thereof, said hollow threaded section being formed with a cross-section through which the top of the hypodermic syringe passes as the syringe body is inserted into said hollow sleeve member such that said hollow threaded section surrounds the tip of the hypodermic syringe after said sleeve means has received the hypodermic syringe, said hollow threaded section further being formed with internal threads which engage the external threads on the hypodermic needle when the hypodermic needle is mounted on the tip extending from the syringe body.

4,540,406

ANTICOAGULANT DELIVERY SYSTEM FOR USE WITH AN AUTO-TRANSFUSION SYSTEM

Clive Miles, Oakland, Calif., assignor to Thoratec Laboratories Corporation, Berkeley, Calif.

Filed May 2, 1983, Ser. No. 490,675
Int. Cl.³ A61M 5/00
U.S. Cl. 604—269 8 Claims



1. An automatic anticoagulant control for an autotransfusion system comprising an anticoagulant container disposed at a predetermined altitude, a suction wand having a passageway for flow therethrough and operable between various altitudes below said predetermined altitude, a hollow control body fixed on and movable with said wand, a diaphragm movable into different positions and dividing said control body into a first chamber and a second chamber, means defining a passage extending between said wand passageway and said first chamber, means for conducting anticoagulant from said anticoagulant container to said first chamber, means for admitting air to said second chamber, a port in said second chamber variably obscured by said diaphragm in said different positions thereof, and means including said port for conducting air from said second chamber to said anticoagulant container.

4,540,407

SURGICAL GLOVES AND SURFACE TREATMENT OF SURGICAL GLOVES FOR AVOIDING STARCH PERITONITIS AND THE LIKE

Robert N. Dunn, 1258 Westgate Ter., Chicago, Ill. 60607

Filed Nov. 14, 1983, Ser. No. 551,111
Int. Cl.³ A61B 19/04
U.S. Cl. 604—292 2 Claims

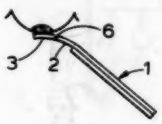
1. In a molded surgical glove that has had at least one surface thereof coated with a powder that serves either as a mold-releasing agent, or for lubricating the inside of the glove, the improvement comprising, in combination, the glove and namely F-68 powder, provided on a surface of the glove.

4,540,408

APPLICATORS FOR PHARMACOLOGICALLY ACTIVE AGENTS, THEIR PREPARATION AND USE

Ronald Lloyd, Sawbridgeworth, United Kingdom, assignor to Smith and Nephew Associated Companies Limited, United Kingdom

Filed Apr. 29, 1982, Ser. No. 373,288
Claims priority, application United Kingdom, Apr. 30, 1981, 8113343
Int. Cl.³ A61N 7/00
U.S. Cl. 604—294 9 Claims



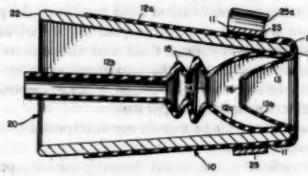
1. A disposable applicator for placing a pharmacologically active agent in contact with a moist body surface which applicator is in the form of an elongate strip with a pharmacologically active agent disposed at one end thereof said pharmacologically active agent being in a soluble matrix element which is attached to the rest of the strip by a rapidly soluble water activated membrane along which the soluble matrix element will separate from the remainder of the strip when the soluble matrix element is applied to a moist body surface.

4,540,409

EXTERNAL MALE CATHETER AND APPLICATOR

Wilford O. Nystrom, Mundelein; Kenneth E. Riedel, Naperville, and David L. Doerschner, Rolling Meadows, all of Ill., assignors to Hollister Incorporated, Libertyville, Ill.

Filed Jul. 5, 1983, Ser. No. 510,904
Int. Cl.³ A61F 5/44
U.S. Cl. 604—349 39 Claims



1. An external catheter and applicator combination, said catheter comprising a sheath of thin, stretchable, elastic material having a generally cylindrical section merging at one end with a tapered neck section terminating in an outlet section of reduced diameter; said applicator comprising a relatively rigid open-ended tube having a length substantially less than that of said sheath and having an outside diameter slightly greater than the maximum inside diameter of said sheath in an unstretched state; said sheath having its neck and outlet sections extending axially within said applicator tube; said sheath extending outwardly through an end opening of said tube with said cylindrical section being disposed externally of the tube and being slidably supported in everted condition upon the outer surface of said tube, whereby, said cylindrical section of said sheath is slidably supported by said applicator tube with the exposed surface of said cylindrical section constituting the inner surface of that section when said catheter is properly fitted upon a patient.

4,540,410

LYOPHILIZED COMPOSITIONS, PREPARATION AND USE THEREOF

Grace Wood, N. Scituate; Benjamin R. Duce, Westborough; Russell W. Pelham, Hull, and James Woiszwillo, Milford, all of Mass., assignors to Serono Pharmaceutical Partners, Randolph, Mass.

Filed Nov. 16, 1982, Ser. No. 442,151
Int. Cl.³ F26B 5/06; A61M 3/00
U.S. Cl. 604—56 **20 Claims**

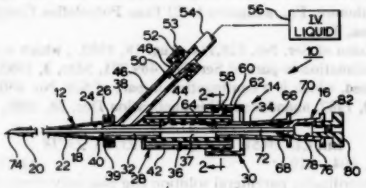
1. A syringe containing a lyophilized mixture of an absorbable gelatin powder and aminocaproic acid.

4,540,411

CATHETER PLACEMENT DEVICE

Raymond O. Bodicky, Oakville, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Nov. 28, 1983, Ser. No. 555,862
Int. Cl.³ A61M 5/00
U.S. Cl. 604—169 **18 Claims**



1. A catheter placement device comprising valve means including a pair of relatively rotatable valve members, a flexible tubular member having opposed end portions connected respectively to said valve members, said tubular member having inner sidewalls defining a passage therethrough and being twistable in response to relative rotation between said valve members to define a variable orifice in said passage, a catheter having a lumen, said catheter having one end portion adapted for insertion into a body and an opposite end portion adapted to connect said lumen in fluid communication with said passage, an introducer needle insertable through said passage and said lumen and retractable therefrom for introducing said catheter into the body, said sidewalls being engageable with and twistable about the sidewalls of said needle in response to predetermined relative rotation between said valve members to close said orifice about said needle to thereby close said passage, and cooperating means on said valve members for holding one of said valve members in any selected one of a plurality of different positions relative to the other of said valve members.

4,540,412

DEVICE FOR MOIST HEAT THERAPY

Ronald R. Van Overloop, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 14, 1983, Ser. No. 513,573
Int. Cl.³ A61H 33/00
U.S. Cl. 604—291 **11 Claims**

1. A device for patient therapy comprising:

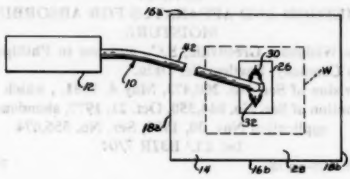
a preheated wet dressing comprising a gauze impregnated with a sterile liquid;

means for generating a continuous supply of treating fluid comprising heated moist air;

a sheet of substantially air impervious material to cover the wet dressing, said sheet having a pair of opposed side edges, a pair of opposed end edges connecting the side edges, and means defining an opening in the sheet;

means for securing spaced portions of the sheet to the patient comprising adhesive on the lower surfaces of the sheet adjacent opposed edges of the sheet;

means for coupling the generating means to the inside of the sheet opening intermediate the sheet and the patient to permit passage of the heated moist air onto the wet dressing, the coupling means including a coupler with a lower, outwardly directed flange located inside of the sheet



opening and a conduit communicating between the generating means and the coupler; and

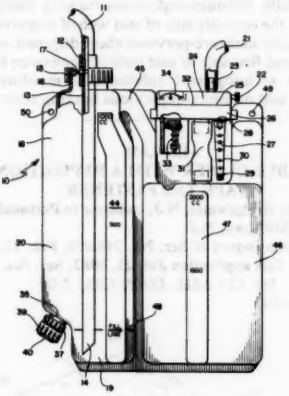
means for permitting said treating fluid to flow outwardly between the sheet and a patient comprising at least one edge of the sheet being free of attachment to the patient whereby, in use of the device, a barrierless opening is defined between the at least one free edge of the sheet and the patient.

4,540,413

CARDIOPULMONARY DRAINAGE COLLECTOR WITH BLOOD TRANSFER ADAPTER

Ronald D. Russo, 8 Candleberry Rd., Barrington, R.I. 02806

Filed Jun. 17, 1983, Ser. No. 505,236
Int. Cl.³ A61M 1/00
U.S. Cl. 604—320 **16 Claims**



1. A drainage collector capable of draining and collecting body fluids from a patient especially blood from a surgical site, said collector comprising a closed collection chamber having first and second openings, said first opening adapted for attachment to a drainage tube from the surgical site, a sump provided within a lower portion of the chamber and adapted for receipt of said drainage tube, said sump providing a liquid seal to prevent reflux of air from entering said patient tube yet permitting air from the patient tube to escape into said chamber and wherein body fluids directed into said sump upwardly rise towards a downstream terminal portion of said chamber, an air passageway in the downstream terminal portion of said chamber permitting the escape of collected gases through said second opening, said second opening forming an exit from the chamber in air communication with said air passageway, dry

means operatively associated with said exit for controlling suction applied to said chamber via said second opening, said chamber including a positive pressure relief valve, and said chamber further incorporating transfer means wherein collected body fluid can be aseptically transferred or emptied therefrom.

4,540,414

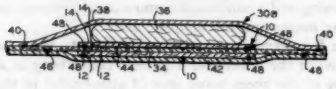
METHOD AND APPARATUS FOR ABSORBING MOISTURE

Marvin Wishman, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 260,473, May 4, 1981, , which is a continuation of Ser. No. 844,350, Oct. 21, 1977, abandoned. This application Nov. 30, 1983, Ser. No. 556,674

Int. Cl.³ B32B *7/04*

U.S. Cl. 604—378 **7 Claims**



1. A multilayer diaper comprising:

a porous facing layer in the form of a web of nonwoven fabric including a plurality of staple polypropylene fibers, a first portion of said polypropylene fibers being unfused on a first side of said fabric and forming liquid-pervious unfused fiber facing means for engaging a liquid-bearing surface, and a second portion of said polypropylene fibers being fused on the opposite side of said fabric separated from the liquid-bearing surface by said first portion of said polypropylene fibers, whereby liquid adsorbed by said liquid-pervious unfused fiber facing means migrates through the unfused fibers toward the fused fibers;

a substantially moisture-impervious backing sheet disposed adjacent the opposite side of said web of nonwoven fabric;

a substantially moisture-pervious sheet disposed adjacent to the unfused first side of said web of nonwoven fabric; and

means for securing said substantially moisture-pervious sheet to said moisture-impervious backing sheet.

4,540,415

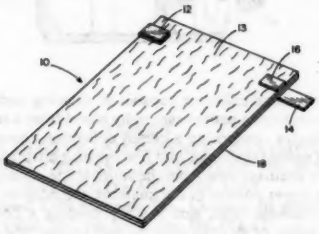
DISPOSABLE DIAPER WITH A REPOSITIONABLE TAPE TAB FASTENER

Ralf Korpman, Bridgewater, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 348,470, Feb. 12, 1982, abandoned. This application Jul. 21, 1982, Ser. No. 400,553

Int. Cl.³ A61L *15/06;* **C09J** *7/02*

U.S. Cl. 604—390 **5 Claims**



1. In a disposable diaper having a pressure-sensitive adhesive closure, a moisture-permeable facing sheet, and a polyethylene or modified polyethylene moisture-impermeable backing sheet, the improvement which comprises the pressure-sensitive adhesive closure having a pressure-sensitive adhesive consisting essentially of at least about 44% by weight of the total elastomers of an elastomeric and thermoplastic block polymer of the structure A-B-A, wherein A is a thermoplastic polymer block of vinyl arene and possesses a glass transition temperature above normal room temperature and B is an elastomeric polymer block of isoprene, the thermoplastic A blocks composing about 8–35 percent by weight of the block polymer, and about 25–125 parts by weight of a tackifier solid at room temperature per 100 parts by weight of the total elastomers and 0–25 parts by weight of a phosphatide per 100 parts by weight of the total elastomers, said tackifier being selected from the group consisting of rosin, rosin derivatives, polyterpenes, hydrocarbon resins, or mixtures thereof, to provide a pressure-sensitive adhesive closure that may be reopened easily numerous times by separating the adhesive closure from the polyethylene backing sheet without substantial damage to the polyethylene backing sheet or to the adhesive closure.

4,540,416

HEAT-STERILIZABLE POLYOLEFIN COMPOSITIONS AND ARTICLES MANUFACTURED THEREFROM

Kiyoshi Hattori, Franklin Lakes, N.J., and John H. Myers, Swarthmore, Pa., assignors to El Paso Polyolefins Company, Odessa, Tex.

Division of Ser. No. 524,114, Aug. 18, 1983, , which is a continuation-in-part of Ser. No. 469,881, Mar. 3, 1983, abandoned, which is a continuation-in-part of Ser. No. 450,948, Dec. 20, 1982, abandoned. This application Dec. 28, 1984, Ser. No. 687,408

Int. Cl.³ B65B *25/00;* **C08L** *23/16, 23/18*

U.S. Cl. 604—410 **12 Claims**

1. A sterilizable parenteral solution bag assembly comprising

an inner sealed plastic film bag containing a parenteral solution;

an outer sealed bag enclosing the inner bag, said outer bag having a width and a length from about 0.25 to about 1.5 inches larger than the corresponding dimensions of the inner bag; the outer film bag resin comprising a blend of:

(a) from about 10 to about 60 wt % of a random copolymer of from about 1 to about 6 wt % ethylene and of from about 94 to about 99 wt % propylene;

(b) from about 40 to about 90 wt % of a linear low density polyethylene produced by copolymerization of ethylene with at least one C_4–C_{18} alpha-olefin comonomer and having a density between about 0.915 and about 0.940 gm/cc,

in the space between the outer and inner bags a quantity of a substance sufficient to control removal of a component from or to control the addition of a component to the parenteral solution through the inner bag film wall.

4,540,417

EYE-MEDICATING HAPTIC

Stanley Poler, 78 E. Second St., New York, N.Y. 10003

Filed May 2, 1983, Ser. No. 490,958

Int. Cl.³ A61M *7/00*

U.S. Cl. 604—895 **23 Claims**

1. As an article of manufacture adapted for self-adherent

removable mounting to the cornea of an eye, an eye-medicating haptic comprising an annular body of flexible sheet material having a central opening sized to span a fully dilated pupil, said body being (1) substantially fenestrated throughout the annular area thereof and (2) of such compliant action as to deform in continuous smooth conformance to the surface curvature of the cornea and to adhere thereto solely through contact with natural moisture of the surface of the cornea, the material of said haptic being characterized by a plurality of medicament pockets, whereby said body is adapted to carry medication releasable on contact with such moisture.

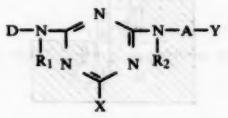
4,540,418

REACTIVE DYE COMPOSITION

Katsumasa Otake, Nara; Takashi Omura, Ashiya; Yutaka Kayane, Ibaraki, and Kunihiko Imada, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 16, 1984, Ser. No. 600,450
Claims priority, application Japan, Apr. 18, 1983, 58-68793
Int. Cl.[3] C09B 67/24; D06P 3/66
U.S. Cl. 8—524 8 Claims

1. A reactive dye composition comprising at least one alkylnaphthalenesulfonic acid/formaldehyde condensate and a compound represented by the following formula,



wherein D is an organic dye residue having at least one sulfo group, R_1 and R_2 are independently a hydrogen atom or a C_1 to C_4 alkyl group unsubstituted or substituted with a halogen atom or a hydroxy, cyano, alkoxy, carboxy, carbamoyl, alkoxycarbonyl, alkylcarbonyloxy, sulfo or sulfamoyl group, A is a phenylene group unsubstituted or substituted with one or two substituents selected from chlorine and bromine atoms and methyl, ethyl, methoxy, ethoxy and sulfo groups, or a naphthylene group unsubstituted or substituted with one sulfo group, X is a halogen atom, and Y is $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Z$ in which Z is group capable of being split by an alkali.

4,540,419

HUMIDITY RESISTANT MATCHES AND PROCESS FOR THE MANUFACTURE THEREOF

Albert F. Lanham, Maidstone; Michael G. C. Cox, Kingsley, and Richard H. Etheridge, London, all of United Kingdom, assignors to Bryant & May Limited, England

PCT No. PCT/GB83/00266, § 371 Date Jun. 18, 1984, § 102(e) Date Jun. 18, 1984, PCT Pub. No. WO84/01572, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 19, 1983, Ser. No. 622,053
Claims priority, application United Kingdom, Oct. 22, 1982, 8230241
Int. Cl.[3] C06F 3/00; C06B 29/00
U.S. Cl. 44—42 18 Claims

1. A process for the manufacture of humidity resistant matches which comprises forming a bulb of an aqueous match head composition on the end of a match splint, and drying the bulb to form the match head, said compostion comprising a mixture of potassium chlorate, filler, combustible material and a water-soluble or water-dispersible binder therefor, characterised in that the aqueous match head composition comprises, as said binder, a water-soluble or water-dispersible salt of a polyacrylic or substituted polyacrylic acid with ammonia or a volatile amine and as said filler, or as a component thereof, zinc oxide.

17. A humidity resistant match comprising a match splint and a head formed thereon from a match head composition ignitable by striking on a surface and comprising a filler, potassium chlorate, a combustible material and a binder therefor, characterised in that the filler is or comprises zinc oxide and the binder is a polyacrylic or substituted polyacrylic acid.

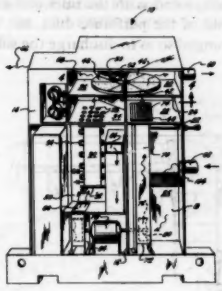
18. a match according to claim 17, characterised in that the match head contains as a cohesion promoting agent a water-soluble or water-dispersible starch or starch derivative, a water-soluble or water-dispersible cellulose derivative or a water-soluble or water-dispersible synthetic organic polymer.

4,540,420

DEHUMIDIFIER FOR FLEXIBLE ENVELOPES

E. B. Wharton, 6222 Summer Lake Dr., and T. R. Iglehart, 897 Baird Dr., both of Baton Rouge, La. 70817

Filed Jul. 23, 1984, Ser. No. 633,601
Int. Cl.[3] B01D 53/06
U.S. Cl. 55—181 11 Claims



1. A dehumidifier for flexible envelopes containing flammable gases and air, said dehumidifier comprising:

a container having an upper and lower process compartment and an adjacent upper and lower regeneration compartment, the lower regeneration compartment containing a heating element and electrical motor;

a regeneration wheel containing a dessicant, said wheel being rotatably mounted in said container so that a first section of said wheel extends into said upper process compartment and a second section of said wheel extends into said upper regeneration compartment through a slot between said process and regeneration compartments;

means for conveying air to be dehumidified from outside said container into said process compartment, directing the air through said dessicant in the first section of said wheel, then returning said air to outside said container;

means for generating a flow of heated air through said regeneration compartment and directing said flow of heated air through the second section of said wheel and thence to the exterior of said container; and

means for maintaining a higher pressure in the lower regeneration compartment which contains the heating element than in the lower process compartment, the means for maintaining the higher pressure comprising an enclosure within the lower process compartment, a first end of the enclosure being in fluid communication with the upper process compartment and a second end of the enclosure being in fluid communication with the lower process compartment, and a blower within the enclosure which is driven by the motor in the lower regeneration compartment, the blower in the enclosure creating a locally higher pressure within the enclosure which reduces the pressure in the lower process compartment and results in the lower regeneration compartment having a relatively higher pressure.

4,540,421

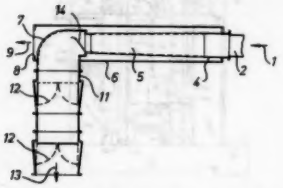
MATERIAL DISCHARGE UNIT

David J. Wilson, Orpinton, England, assignor to Matthews and Yates Limited, Manchester, England

Filed Jan. 26, 1984, Ser. No. 573,954
Claims priority, application United Kingdom, Jan. 28, 1983, 8302350; Feb. 4, 1983, 8303117
Int. Cl.[3] B01D 50/00, 46/24; B65G 53/06
U.S. Cl. 55—432 9 Claims

1. In a material discharge unit for separating lightweight solid material elements of substantial size from a conveying gas stream: the improvement that the unit comprises an axially

elongated housing having an inlet end and a discharge end having gas outlet means, an axially elongated perforate duct located in and extending through the housing, said perforate duct having an inlet located at one end thereof for feeding the conveying stream, with suspended solids, to the interior of the perforate duct and a discharge end spaced from the inlet end, a perforate bend located within the housing and having an inlet end and a discharge end with the inlet end end connected to the discharge end of the perforate duct, the bend being constructed and arranged so as to discharge the solid material at an



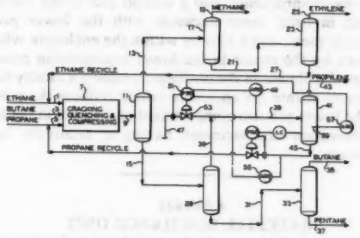
angle to the gas flow stream direction through said perforate duct, generally vertically downwardly, while allowing the gas stream to continue onwardly to the discharge end of the housing and out the gas outlet means, and a deflection baffle located near the junction between the discharge end of the perforate duct and the inlet to the perforate bend, the deflection baffle being arranged so as to deflect the conveying stream and solid material away from the solid material discharge direction in the perforate duct so that the conveying stream and solid material impinge on the wall of the perforate bend at an acute angle to the axis of the perforate duct.

4,540,422

CONTROL OF THE CONCENTRATION OF METHYLACETYLENE AND PROPADIENE IN A PROPYLENE/PROPANE FRACTIONATION COLUMN

Joe B. Hampton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 18, 1984, Ser. No. 601,762
Int. Cl.³ F25J *3/02*; B01D *3/42*
U.S. Cl. 62—21 **9 Claims**



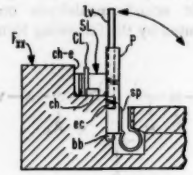
4. A method for separating propylene/propane mixtures containing methylacetylene and propadiene contaminants in a fractionation column comprising controlling the concentration of methylacetylene and propadiene in the column by injecting propane into the inlet stream from a source external to the feedstream with control of the propane addition in response to the measured methylacetylene content of the bottoms product from the propylene/propane fractionation column.

4,540,423

METHODS OF FASHIONING GLASS BONDED DEVICE

Otto Fuchs, Westlake Village, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 299,095, Sep. 3, 1981,. This application Oct. 17, 1983, Ser. No. 531,557
Int. Cl.³ C03C *29/00*
U.S. Cl. 65—18.1 **11 Claims**



1. An improved method for retaining an array of tiny fragile workpieces in a common fixture during processing where each workpiece must be held therein by a fairly precise constant retention pressure, the method comprising:

providing a workpiece-receiving channel in the fixture with a prescribed precision-oriented precisely flat registration surface along one side of the channel; and a precisely flat base surface orthogonal thereto;

disposing each workpiece at a respective site along the base surface of the fixture channel; said fixture having retainer means for each workpiece at its site in the form of contact means resiliently applicable against the workpiece by associated lever means to press it against the registration side of the channel;

clamping the workpieces in place with the contact means; conducting the treatment and releasing the workpieces for removal by actuation of the lever means.

3. An improved method of fashioning and glass bonding a plurality of slider assemblies, comprising:

providing fixture means having a fixture slot means including a pair of orthogonal base and side surfaces which are precisely flat and carefully aligned;

the slot means being adapted to form N sites along the base, each for receiving a respective slider assembly;

also providing like retainer means for each site, being adapted to be selectively actuated into and out of resilient contact with the respective slider assembly;

disposing each assembly in a respective one of said slot sites and retaining it in place with said associated retainer means; and then performing at least a glass bonding step while retained in said slot.

4,540,424

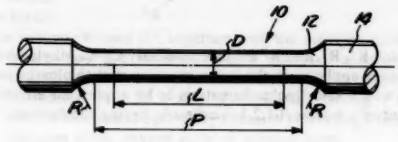
HEAT-RESISTING ALLOY FOR ROLLS FOR GLASS FORMING

Yoshiaki Yamakami, Toyonaka, and Arata Yoshimitsu, Katano, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 352,864, Feb. 26, 1983, abandoned. This application Sep. 30, 1983, Ser. No. 509,730
Int. Cl.³ C03B *35/18*
U.S. Cl. 65—100 **4 Claims**

1. In a process of continuous casting or glass forming operation wherein a material at a high temperature is contacted with the surface of a roller, the surface of the roller being subjected to repetition of heating and cooling and made of a heat-resisting alloy, the improvement wherein the heat-resisting alloy has

high resistance to heat cracking under repeated heating and cooling conditions and consists essentially of the following



components in the following proportions in terms of % by weight,

C	0.01–0.20
Si	0.10–1.5
Mn	0.10–2.0
Ni	0.10–6.0
Cr	14.0–18.0

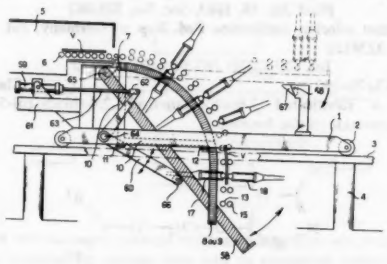
the balance being substantially Fe and unavoidable impurities.

4,540,425

APPARATUS FOR BENDING AND TEMPERING OF THERMOPLASTIC SHEETS OF DIFFERENT CURVATURES

Aureliano Bocelli, Leghorn, and Carlo Colombini, San Prospero, both of Italy, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Jul. 20, 1984, Ser. No. 632,807
Claims priority, application France, Jul. 20, 1983, 83 11954
Int. Cl.[3] C03B *23/033*
U.S. Cl. 65—273 **15 Claims**



1. In apparatus for bending thermoplastic sheets comprising a shaping bed for supporting said sheets, said bed comprising a plurality of means for moving said sheets in a first direction through said bed and mounting means for supporting said moving means, said mounting means being positioned in said first direction along a profile of desired curvature, the improvement comprising:

a template having a curved surface;

means for interconnecting said mounting means in a flexible longitudinal strip; and

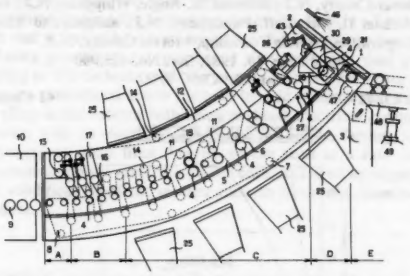
means for mounting said interconnected mounting means on said template, whereby the mounting means are positioned in said first direction along the profile of desired curvature.

4,540,426

APPARATUS FOR BENDING AND TEMPERING THERMOPLASTIC SHEET MATERIAL

Aureliano Bocelli, Leghorn, and Carlo Colombini, San Prospero, both of Italy, assignors to Saint Gobain Vitrage, Courbevoie, France

Filed Jul. 20, 1984, Ser. No. 632,782
Claims priority, application France, Jul. 20, 1983, 83 11955
Int. Cl.[3] C03B *23/033, 27/04*
U.S. Cl. 65—273 **15 Claims**



1. In an apparatus for bending or bending and tempering of thermoplastic sheets in which the sheets pass through a shaping bed comprising a plurality of support elements and a plurality of holding means such as rollers or curved rods placed along a curved profile having an upward concavity, means for transfering the sheets from said apparatus to a conveyor having a different slope comprising:

pivoting holding means associated with the last support element of said shaping bed, said pivoting holding means being mounted in a frame which pivots around an axis which coincides with the axis of rotation of said last support element so as to move the holding means from a position in which it is aligned with the curved profile of the shaping bed to one where it is aligned with the slope of the conveyor, and

means for applying to said frame a restoring force having a tendency to bring said pivoting holding means mounted in said frame back into such a position that said pivoting means is aligned with the curved profile of the shaping bed.

4,540,427

METHOD FOR IMPROVING WATER RETENTION QUALITIES OF SOIL AND AN AGENT FOR PERFORMING THIS METHOD

Gottfried Heibling, Pfäffikon, Switzerland, assignor to Isaflex AG, Schlieren, Switzerland

Continuation of Ser. No. 168,134, Jul. 14, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,387
Claims priority, application Switzerland, Jul. 31, 1979, 7049/79
Int. Cl.[3] C05G *3/04*
U.S. Cl. 71—27 **5 Claims**

1. A method for increasing the water absorptivity and water retention capacity of soil for growing plants, said method comprising the steps of:

mixing the soil with a 1 to 20% proportion of cross-linked, dry, solid, granular acrylamide polymer by weight, said acrylamide polymer being the product of cross-linking acrylamide with N,N′-methylene bisacrylamide in the absence of an inert filler, said dry, acrylamide polymer being in the form of granular particles having an average size in the range of 0.5 to 5.0 mm;

introducing this soil mixture to the main root areas of the plants; and

watering said soil mixture such that said acrylamide polymer absorbs water and swells to at least 200% of its orginal volume.

4,540,428

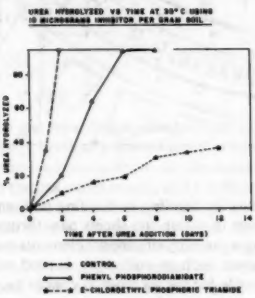
PHOSPHOROTRIAMIDATE UREASE INHIBITORS AND UREASE INHIBITED UREA BASED FERTILIZER COMPOSITIONS

Michael Van Der Puy, Cheektowaga; Larry L. Hendrickson, Camillus, both of N.Y.; Jaroslav F. Kolc, Randolph Township, Dover County, N.J.; Milorad M. Rogic, Whippany, N.J., and Michael D. Swerdloff, Parsippany, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

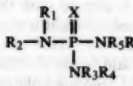
Filed Mar. 16, 1983, Ser. No. 475,980

Int. Cl.[3] **C05C** *9/00*

U.S. Cl. 71—28 **42 Claims**


UREA HYDROLYZED VS TIME AT 30° C USING
10 MICROGRAMS INHIBITOR PER GRAM SOIL
% UREA HYDROLYZED
TIME AFTER UREA ADDITION (DAYS)
CONTROL
PHENYL PHOSPHORODIAMIDATE
2-CHLOROETHYL PHOSPHORIC TRIAMIDE

1. A composition comprising an acceptable carrier and a urease inhibiting effective amount of one or more phosphorotriamidate compounds of the formula:



wherein:

X is oxygen or sulfur;

R_1 is alkyl substituted with one or more nucleophilic substituents;

R_2 is R_1, hydrogen, or substituted or unsubstituted cycloalkenyl, alkenyl, alkynyl, cycloalkyl, aralkyl, aryl or alkaryl wherein permissible substituents are one or more trihalomethyl, naphthoxy, alkyl, halogen, arylmercapto, phenoxy, phenyl, nitro, cyano, amino, alkylamino, dialkylamino, alkoxy, mercapto, alkylmercapto, alkylcarbonyl, arylamino, arylcarbonyl, alkoxycarbonyl, carboxy, diarylamino or carbonamide; and

R_3, R_4, R_5 and R_6 are individually hydrogen or alkyl having from 1 to about 4 carbon atoms.

4,540,429

4-PHENYL-1,2,3-THIADIAZOLES AS HERBICIDE EXTENDERS

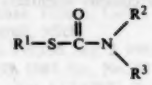
Joanna K. Hsu, Sunnyvale, and Arnold D. Gutman, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 244,419, Mar. 16, 1981, abandoned. This application Jun. 1, 1982, Ser. No. 383,449

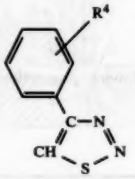
Int. Cl.[3] **A01N** *47/12, 43/82;* **C07D** *285/06*

U.S. Cl. 71—90 **11 Claims**

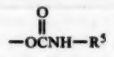
1. A method of extending the soil life of a thiolcarbamate having the formula



in which R^1, R^2, and R^3 are independently C_2–C_4 alkyl; which comprises applying to the soil containing said thiolcarbamate or to which said thiolcarbamate is to be applied an effective amount of a 4-phenyl-1,2,3-thiadiazole having the formula



in which R^4 is selected from the group consisting of trifluoromethyl and



in which R^5 is selected from the group consisting of C_1–C_3 alkyl, phenyl, and phenyl substituted with one or more members selected from the group consisting of halogen and trifluoromethyl.

4,540,430

HERBICIDALLY ACTIVE NOVEL SUBSTITUTED 3-TRICHLOROMETHYL-1,2,4-THIADIAZOL-5-YL-OXYACETAMIDES

Heinz Förster; Hans-Joachim Diehr; Jörg Stetter, all of Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

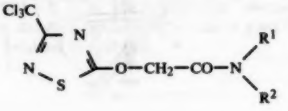
Filed Jul. 18, 1983, Ser. No. 515,082

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1982, 3228131

Int. Cl.[3] **C07D** *285/08;* **A01N** *43/82*

U.S. Cl. 71—90 **11 Claims**

1. A substituted 3-trichloromethyl-1,2,4-thiadiazol-5-yl-oxyacetamide of the formula



in which

R^1 and R^2, which can be identical or different, individually represent alkyl, cyanoalkyl, alkoxyalkyl, alkylthioalkyl, alkenyl, alkinyl or alkoxy, each having up to 10 C atoms, cycloalkyl or cycloalkenyl, each having up to 12 C atoms, aralkyl which has 1 or 2 carbon atoms in the alkyl part and 6 or 10 carbon atoms in the aryl part, and is optionally substituted by halogen, or represents aryl having 6 or 10 carbon atoms, it being possible for the aryl radical to be substituted by 1 to 3 halogen atoms, 1 to 3 alkyl or halogenoalkyl groups each having 1 to 4 carbon atoms, nitro, cyano or alkoxy having 1 to 4 carbon atoms,

or wherein

the radicals R^1 and R^2, together with the nitrogen atom to which they are bonded, form a partially unsaturated and-

/or benzofused monocyclic or bicyclic structure which has up to 15 carbon atoms and is optionally substituted by 1 to 3 alkyl groups, each having 1 to 5 carbon atoms, or by two geminal alkoxy groups, each having 1 to 3 carbon atoms,

or wherein

the radicals R^1 and R^2, together with the nitrogen atom to which they are bonded, form a saturated monocyclic structure which has up to 6 carbon atoms, is optionally substituted by 1 to 3 alkyl groups, each having 1 to 5 carbon atoms, and optionally contains in the ring a further nitrogen atom, oxygen atom or sulphur atom.

4,540,431

3-CHLOROBENZYL-3,6-DICHLORO-2-METHOXYBENZOATE AS A GRAPE RIPENER

Louis G. Nickell, Chicago; Leonard J. Stach, Riverside, and George F. Luteri, Mt. Prospect, all of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 11, 1984, Ser. No. 619,085

Int. Cl.³ E05B *59/00*

U.S. Cl. 71—107 **1 Claim**

1. A method of increasing the recoverable sugar in grapes which comprises applying to the grapes an effective amount of 3-chlorobenzyl-3,6-dichloro-2-methoxybenzoate.

4,540,432

CONTINUOUS PROCESS OF MELTING SPONGE IRON

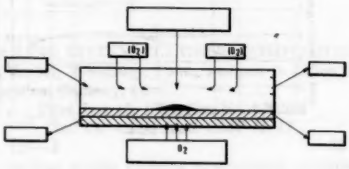
Martin Hirsch, Friedrichsdorf; Peter Fischer, Bad Vilbel-Dortelweil, and Harry Serbent, Hanau am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 8, 1984, Ser. No. 577,952

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304504

Int. Cl.³ C21B *11/08*

U.S. Cl. 75—43 **16 Claims**



1. A continuous process of melting sponge iron which comprises introducing sponge iron into an elongated horizontal reactor in an intermediate region thereof comprising 20 to 40% of the total length of said reactor and depositing said sponge iron onto molten material contained in said horizontal reactor, introducing fine grain solid containing carbonaceous fuel hydrocarbons and a high-oxygen containing gas into said reactor by blowing the same into said molten material from below in said intermediate region, the amount of oxygen and carbon being so controlled such that the resultant molten iron contains 1 to 3% by weight carbon, converting substantially all of the remaining solid carbonaceous fuel containing hydrocarbon to carbon monoxide and hydrogen, introducing an oxygen containing gas into the free space above said molten material and in said free space burning said carbon monoxide and hydrogen whereby to supply energy to said process and removing slag and molten iron at opposite ends of said horizontal reactor.

4,540,433

TREATMENT OF FERROMANGANESE

Thomas R. Curr, and Ingrid E. Schmidt, both of Johannesburg, South Africa, assignors to Council For Mineral Technology, Randburg, South Africa

Filed Oct. 3, 1983, Ser. No. 538,498

Claims priority, application South Africa, Oct. 4, 1982, 82/7253

Int. Cl.³ C22B *4/00*

U.S. Cl. 75—10 R **15 Claims**

1. A process for remelting ferromanganese alloy fines to produce an improved solid ferromanganese alloy product comprising melting the ferromanganese alloy fines in a furnace bath that is heated by a transferred arc thermal plasma having a plasma generating gun positioned above the bath, said gun serving as the cathode with the plasma forming gas being an inert gas introduced above the bath by said gun and said molten alloy in the furnace bath being in direct electrical communication with an electrode serving as the anode, feeding ferromanganese alloy fines directly to the bath at a rate that maintains a molten condition in the bath, followed by tapping and solidification of the molten alloy to form said improved product.

4,540,434

PROCESS AND DEVICE FOR FEEDING METAL INTO A MOLTEN METAL BATH

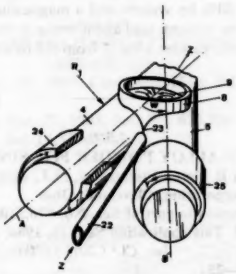
Rolf Roggen, Sion, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 16, 1984, Ser. No. 631,188

Claims priority, application Switzerland, Aug. 4, 1983, 4229/81

Int. Cl.³ C22B *9/00*

U.S. Cl. 75—93 R **4 Claims**



1. A process for feeding metal to be melted to a stream of molten metal comprising providing a source of molten metal, providing a source of metal to be melted, dividing said molten metal into a first stream of metal rotating in a clockwise direction and a second stream of metal rotating in a counterclockwise direction, joining said first stream and said second stream so as to form a furrow in the region where the counter-rotating streams meet and feeding said metal to be melted to said furrow wherein said metal is sucked down by said counter-rotating streams.

4,540,435

SOLVENT EXTRACTION OF GOLD AND SILVER ANIONS UNDER ALKALINE CONDITIONS

Jan D. Miller, and Michael B. Moolman, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

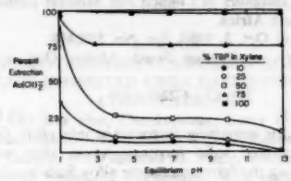
Filed Aug. 26, 1983, Ser. No. 527,311

Int. Cl.³ B01D *11/04*

U.S. Cl. 75—118 R **9 Claims**

1. A method for extracting gold or silver values from an aqueous system containing gold or silver cyanide anions com-

prising contacting said system with a strong solvating extractant having minimal water solubility at pH ranges of above



about 7, wherein said extractant is an alkyl phosphorus oxide or an organic sulfur oxide.

4,540,436

TREATMENT AGENT FOR CAST IRON MELTS AND A PROCESS FOR THE PRODUCTION THEREOF

Friedrich Wolfsgruber, Tacherting; Ernst A. Weiser, Unterneukirchen; Werner Gmöhling, Hufschlag; Hans Kern, Trostberg, and Karl J. Reifferscheid, Karben, all of Fed. Rep. of Germany, assignors to SKW Trostberg AG, Trostberg and Metallgesellschaft AG, Frankfurt, both of, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,634

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324357; Feb. 9, 1984, 3404607

Int. Cl.[3] C22C *1/02*; C21C *1/10*

U.S. Cl. 75—130 A **15 Claims**

1. A treatment agent for cast iron melts, the treatment agent comprising ferrosilicon magnesium with a silicon content of from 40 to 80% by weight and a magnesium content of from 0.5 to 15% by weight, said agent being in the form of granules with a specific surface area of from 0.2 to 0.8 m^2/g. according to BET.

4,540,437

TIN ALLOY POWDER FOR SINTERING

Krishnakant B. Patel, Piscataway, N.J., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 576,510, Feb. 2, 1984, abandoned. This application Sep. 25, 1984, Ser. No. 653,996

Int. Cl.[4] C22C *13/00*

U.S. Cl. 75—251 **20 Claims**

1. A tin alloy powder comprising a major proportion of tin, about 0.1 to 5.0 weight percent phosphorus and incidental impurities.

4,540,438

FERROSILICON AGGREGATE FOR CONCRETE AND RESINS

Paul F. Gutmann, 105 Farwood Dr., Moreland Hills, Ohio 44022, and Donald R. Holm, 4724 Holm Rd., Oregon, Wis. 53575

Filed Sep. 29, 1983, Ser. No. 537,062

Int. Cl.[3] C04B *7/02*

U.S. Cl. 106—97 **15 Claims**

1. In a particulate mixture for embedding into the unset upper surface of a concrete floor the improved mixture comprising

Portland cement, and

ferrosilicon particles having a silicon content of no more than 20%, and having a particle size range of 6 mm. to 200 mesh; whereby all ferrosilicon in said mixture is inert to chemical reaction with the other components of said mixture.

4,540,439

PROCESS FOR PREPARATION OF GYPSUM SHAPES

Hans-Friedrich Kurandt, Lüneburg, Fed. Rep. of Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 6, 1982, Ser. No. 375,709

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117813

Int. Cl.[3] C04B *11/00, 11/10*; C01F *11/46*

U.S. Cl. 106—109 **8 Claims**

1. A shaped gypsum article prepared by a process which comprises:

(a) controlling the water content of a moist α-calcium sulfate hemihydrate obtained by filtration from the production of phosphoric acid without preliminary purification, drying, or calcining to be in the range of from 20 to 40% by weight,

(b) mixing the hemihydrate from step (a) with 0.5 to 20% by weight calcium hydroxide or calcium oxide, and

(c) compression molding the mixture from step (b) without adding any additional binding agent within 8 hours of said mixing,

wherein said article has a density of from 1.61 to 1.8 kg/dm^3 and a compression strength of 200 to 285 kp/cm^2 when measured by DIN 106 for the size NF=240×115×71 mm.

4,540,440

IVORYLIKE COMPOSITION PLATE FOR COVERING A WOODEN BASE AND A METHOD FOR PRODUCING THE SAME

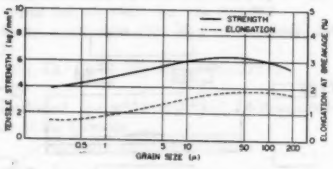
Yutaka Oshima, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 565,389, Dec. 27, 1983, abandoned, which is a division of Ser. No. 501,968, Jun. 10, 1983, Pat. No. 4,447,268, which is a continuation of Ser. No. 296,483, Aug. 26, 1981, abandoned. This application May 11, 1984, Ser. No. 609,489

Claims priority, application Japan, Sep. 2, 1980, 55-121663; Dec. 8, 1980, 55-172956

Int. Cl.[3] C08L *89/00*

U.S. Cl. 106—148 **7 Claims**



1. An ivorylike composition plate for covering a wooden base comprising

casein matrix hardened with folmaldehyde and

from about 14.3 to about 69.5% by weight of non-hydrated inorganic filler selected from a group consisting of silica oxide, calcium phosphate, alumina, calcium carbonate, barium sulfate and calcium sulfate.

4,540,441

SALT REMOVAL FROM TREATED TITANIUM DIOXIDE

Theodore A. Rado, Oklahoma City, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed May 3, 1983, Ser. No. 491,263

Int. Cl.[3] C09C *1/36*

U.S. Cl. 106—300 **10 Claims**

1. A method for producing titanium dioxide particles having a finish from raw titanium dioxide particles comprising:

preparing an aqueous slurry of raw titanium dioxide particles;

treating the slurry with finishing chemicals to produce a treated slurry comprising titanium dioxide particles having a finish and byproduct salts;

treating the treated slurry with demineralizing resins in their proton and hydroxide forms to produce a slurry of substantially salt-free titanium dioxide particles having a finish and mixed bed demineralizing resins in salt forms; and

recovering the substantially salt-free titanium dioxide particles having a finish from the mixed bed demineralizing resins in salt forms.

4,540,442

COMPOSITIONS AND METHODS FOR REMOVING SEALANT COMPOSITIONS

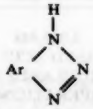
Timothy J. C. Smith, Colmar, Pa.; Jürgen Geke, Düsseldorf, Fed. Rep. of Germany, and Robert Q. Cooper, Lansdale, Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Filed Feb. 16, 1984, Ser. No. 580,965

Int. Cl.³ C03C *23/00*; B08B *7/00*; C11D *9/30*

U.S. Cl. 134—2 **25 Claims**

1. A aqueous alkaline composition which is effective in removing a resin-containing sealant from ferrous and zinc containing metals without adversely affecting the surfaces of the metal, containing as essential ingredients: an alkanolamine, an aliphatic carboxylic acid containing 5 to 18 carbon atoms, and an arylenetriazole having the formula



where Ar is o-phenylene, monoalkyl-o-phenylene, polyalkyl-o-phenylene, o-naphthylene and alkyl-o-naphthylene where the alkyl group has from 1 to 4 carbon atoms, wherein the alkanolamine and the aliphatic carboxylic acid are present in the composition in amounts sufficient to remove the resin-containing sealant when the aqueous composition is applied thereto and wherein the arylenetriazole is present in a quantity sufficient to prevent attack on the metal surfaces by the aqueous alkaline solution.

4,540,443

COOLING SYSTEM CLEANING COMPOSITION

Alan G. Barber, Woodbury, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 15, 1984, Ser. No. 620,968

Int. Cl.³ C23G *1/18*; C23F *11/12*

U.S. Cl. 134—2 **32 Claims**

1. A cooling system cleaning composition comprising an aqueous solution of between about 0.3 and about 15 weight percent of a tetra-alkali metal salt of ethylenediaminetetraacetic acid, between about 0.6 and about 35 weight percent of a water-soluble salt of citric acid and between about 0.2 and about 20 weight percent of a water-soluble salt of nitric acid, said weight percentages based on the sodium salts and said composition being effective for removing solder bloom.

4,540,444

ALUMINUM CLEANER AND SYSTEM

Timm L. Kelly, Oreland, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Aug. 12, 1982, Ser. No. 407,611

Int. Cl.³ C23G *1/14*

U.S. Cl. 134—3 **6 Claims**

6. In a method for cleaning aluminum or aluminum alloy beverage containers comprising the steps of prerinse; acid prewash; acid clean; rinse; and deionized water rinse, the improvement comprising adding the following steps between the rinse and deionized water rinse steps to remove trace impurities including C_7-C_9 aldehydes that cause off-flavor in beverages:

A. spraying said containers with an alkaline cleaning solution for from about 5 seconds to about 1 minute at a temperature in the range of from about 90° F. to about 130° F., wherein the alkaline solution consists essentially of

(a) from about 0.2 to about 0.6 g/l of at least one alkali metal or ammonium carbonate;

(b) from about 2.0 to about 5.1 g/l of at least one alkali metal or ammonium tripolyphosphate;

(c) from about 1.7 to about 4.2 g/l of at least one alkali metal or ammonium tetraborate pentahydrate;

(d) from about 0.2 to about 0.5 g/l of at least one alkali metal or ammonium metasilicate;

(e) from about 1.4 to about 3.6 g/l of at least one tri(alkali metal or ammonium) phosphate;

(f) from about 0.3 to about 0.9 g/l of at least one alkali metal or ammonium gluconate or glucoheptonate; and

(g) from about 0.02 to about 0.27 g/l of at least one surfactant which is stable in the aqueous alkaline solution; and

B. rinsing the containers with water.

4,540,445

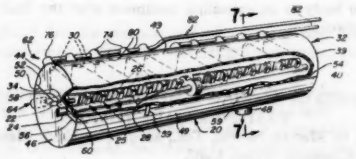
METHOD AND APPARATUS FOR CLEANING GRIPPER ASSEMBLIES

William P. Burns, Jr., 5944 Clarendon Hills Rd., Clarendon Hills, Ill. 60514

Filed Jun. 27, 1984, Ser. No. 625,316

Int. Cl.³ B08B *3/00*, *3/02*

U.S. Cl. 134—21 **12 Claims**



10. A method of cleaning a gripper assembly of the type including a plurality of spaced gripper fingers, the method comprising the steps of:

placing a containment structure in contact with surfaces on a printing press to define an enclosed interior space about said gripper assembly, said enclosed interior space being in communication with a vacuum pump to enable removal of matter from said interior space;

blowing air at said gripper assembly through a plurality of nozzles mounted on said containment structure while operating said vacuum pump;

spraying cleaning fluid onto said gripper assembly from a plurality of different nozzles mounted on said containment structure while operating said vacuum pump;

blowing air over said gripper assembly while operating said vacuum pump; and

removing said containment structure from contact with said printing press.

4,540,446

METHOD OF FORMING OHMIC CONTACT ON GAAS BY GE FILM AND IMPLANTING IMPURITY IONS THERETHROUGH

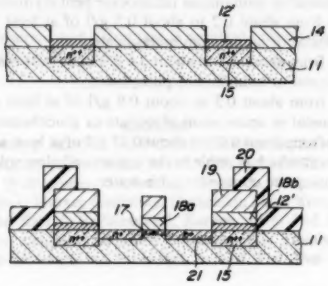
Toshio Nonaka; Hiroshi Nakamura, and Choho Yamagishi, all of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,578

Claims priority, application Japan, Sep. 19, 1983, 58-171382; Oct. 4, 1983, 58-184488

Int. Cl.³ H01L *21/283, 7/54, 21/225*

U.S. Cl. 148—1.5 **8 Claims**



1. In a method of manufacturing a GaAs compound semiconductor device including steps of forming a plurality of semiconductor elements in a GaAs compound semiconductor body by impurity diffusion or ion implantation, forming ohmic electrodes on these semiconductor elements, and forming connection wiring among these elements, the improvement comprising the steps of applying a Ge film on an n+ implanted region for forming ohmic electrodes thereon, implanting impurity ions into the Ge film with a concentration higher than that of the implanted region, applying to the overall surface of the semiconductor body, including the Ge film, a metal comprising a W-Al alloy having a sufficiently high melting point that the Ge film becomes an n++ Ge film and the n+ implanted region of the GaAs substrate is activated by subsequent high temperature annealing treatment, and subjecting the semiconductor body to an annealing treatment after the final ion implantation step.

4,540,447

METHOD OF MAKING A MULTIGRIP FASTENER AND FASTENER MADE THEREBY

Larry D. Mercer, Hewitt, Tex., assignor to Huck Manufacturing Company, Irvine, Calif.

Filed Jun. 9, 1983, Ser. No. 502,740

Int. Cl.³ C21D *8/00*

U.S. Cl. 148—2 **16 Claims**

1. In a swage-type fastener including a pin and a collar adapted to be swaged onto said pin, the method of making said pin wherein said pin includes a plurality of combination locking and breakneck grooves and with said collar adapted to be swaged into said grooves with one of said grooves acting as a breakneck whereby excess length of said pin is severed at that one of said grooves generally at the end of said collar and in response to a relative axial force applied between said pin and said collar, said method comprising:

(a) forming a steel billet,

(b) hot rolling said billet into a rod,

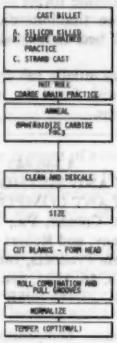
(c) sizing said rod to the desired diameter,

(d) cutting blanks of desired length from said sized rod and forming an enlarged pin head on said cut blanks,

(e) rolling said cut blanks to form a pin having combination locking and breakneck grooves thereon,

(f) normalizing said pin at a preselected temperature in a carbon restoring atmosphere to austenitize and carbon restore the steel, and

(g) cooling said pin from its austenitized state to form a generally homogeneous microstructure comprised predominantly of coarse grained pearlite colonies in a fine matrix of proeutectoid ferrite, said pearlite colonies having an apparent austenetic grain size of from about ASTM 1 to about ASTM 5, whereby fracture at said one of said grooves is facilitated.



4,540,448

MICROEMULSION-BASED ACID COMPOSITION AND ITS USES, PARTICULARLY FOR CLEANING OPERATIONS

Jean C. Gautier, Billere, and Jacques Kamornicki, Lescar, both of France, assignors to Societe Nationale Elf Aquitaine, France

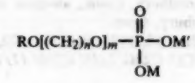
Filed Mar. 21, 1984, Ser. No. 591,512

Claims priority, application France, Mar. 24, 1983, 83 04824

Int. Cl.³ C11D *1/34, 3/43;* **C23F** *7/08;* **C23G** *1/04*

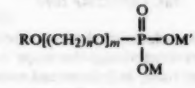
U.S. Cl. 148—6.15 R **18 Claims**

1. A microemulsion capable of simultaneously degreasing and scouring a metal substrate comprising, by weight, 18–45% of aqueous acid, 30–65% of liquid hydrocarbon or chlorocarbon, 4–23% of a 4 to 12 carbon atom mono- or dihydric alcohol and 4–28% of one or a mixture of phosphoric acid esters of the formula



in which M is selected from the group consisting of hydrogen, sodium, potassium, ammonium, alkaline earth metal and zinc, M' is M or $RO[(CH_2)_nO]_m$—, wherein each individual R is phenyl or alkenyl of 1–30 carbon atoms, each individual n is 1–6 and each individual m is 2–15.

6. A method of simultaneously degreasing and scouring a metal substrate comprising contacting the substrate with a microemulsion, separating the substrate and the microemulsion and rinsing the substrate with water, wherein the microemulsion contains, by weight, 18–45% aqueous acid, 30–65% liquid hydrocarbon or chlorocarbon, 4–23% of a 4 to 12 carbon atom mono- or dihydric alcohol and 4–28% of one or a mixture of phosphoric acid esters of the formula



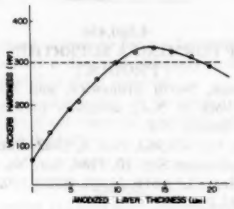
in which M is selected from the group consisting of hydrogen, sodium, potassium, ammonium, alkaline earth metal and zinc, M' is M or $RO[(CH_2)_nO]_m$—, each individual R is alkyl or alkenyl of 1–30 carbon atoms, phenyl or alkylphenyl, each individual n is 1–6 and each individual m is 2–15.

4,540,449

ALUMINUM SUBSTRATE FOR MAGNETIC RECORDING MEDIA

Koichi Yoshida; Yoshio Hirayama; Yasuo Oka; Takashi Kajiyama, and Kunihiko Hotta, all of Shizuoka, Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 584,996
Claims priority, application Japan, Mar. 31, 1983, 58-54009
Int. Cl.³ B21C *1/00*
U.S. Cl. 148—31.5 **3 Claims**



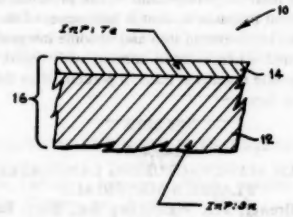
1. An aluminum substrate for magnetic recording media comprising an aluminum alloy plate composed of 2 to 6% by weight magnesium, the remainder being aluminum and impurities, the limits of the allowable contents of said impurities being 0.003% iron, 0.005% silicon, 0.25% copper, 0.5% zinc, 0.0005% manganese, 0.0005% chromium, 0.0005% nickel, and 0.0005% titanium and for the total amount of other impurities 0.001%, said aluminum base plate having on the surface thereof an anodic oxidation film having a thickness more than 3 μm formed by a chromic acid anodization process.

4,540,450

INP:TE PROTECTIVE LAYER PROCESS FOR REDUCING SUBSTRATE DISSOCIATION

Frank Z. Hawrylo, Trenton, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 384,291, Jun. 2, 1982, abandoned. This application Oct. 17, 1984, Ser. No. 661,646
Int. Cl.³ H01L *23/208*
U.S. Cl. 148—171 **6 Claims**



1. An improved method of fabricating a semiconductor device having therein a plurality of layers, said semiconductor device having a substrate upon which said layers are operably deposited, said substrate consisting of Group III–V elements, wherein the improvement comprises the steps of:

forming a growth melt of Group III, V and VI elements by liquid phase epitaxy;

homogenizing said growth melt;

forming a Group III wipe solution;

wiping said substrate with said wipe solution;

placing said substrate after being wiped in contact with said growth melt;

depositing on said substrate a doped protective layer from said growth melt for preventing the dissociation of said substrate;

removing from said growth melt said substrate with said doped protective layer thereon; and

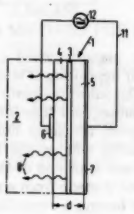
removing said substrate having said protective layer thereon from a growth furnace whereby said protective layer allows surface preparation for forming said semiconductor device thereafter.

4,540,451

METHOD FOR MANUFACTURING A LUMINESCENT DIODE HAVING A HIGH FREQUENCY AND HIGH LIMIT FREQUENCY FOR ITS MODULATION CAPABILITY

Siegfried Leibenzeder, Erlangen, and Claus Weyrich, Gauting, near Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 22, 1982, Ser. No. 390,994
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1981, 3124817
Int. Cl.³ H01L *21/208*
U.S. Cl. 148—173 **2 Claims**



1. A method for the manufacture of a luminescent diode with a predetermined emission wavelength maximum, comprising the steps of:

determining a desired emission wavelength maximum;

providing a substrate member with a deposition face;

providing a melt to be deposited and which comprises the elements $Ga_{1-x}Al_xAs$, and which also contains an n-conductivity doping component selected from the group consisting of sulfur, selenium, and tellurium;

depositing said melt onto said deposition face in a continuous single step liquid phase epitaxial procedure so as to continuously grow a single layer in a direction normal to the deposition face of said substrate so as to form an epitaxial material crystal body on the substrate member, said epitaxial deposition resulting in a substantially continuously decreasing value x of the aluminum concentration in said body in said normal direction, a thickness d of said body being 150 to 200 μm measured in said normal direction, said resulting continuously decreasing value x resulting in a continuously decreasing range of band gap values, a specific band gap value within said range corresponding to said predetermined desired emission wave length maximum;

during said single step deposition, adding zinc as a p-conductivity doping component to the melt sufficient to over-compensate said n-conductivity doping component, and starting said adding at a time when said corresponding specific band gap value is attained and continuing until completion of the

epitaxial deposition, said zinc-doping producing a p-doped portion of said epitaxially grown body;

removing said substrate member after completion of the epitaxial growth of the body; and

providing electrodes on opposite faces of said body.

4,540,452

PROCESS FOR MANUFACTURING A SEMI-CONDUCTOR DEVICE OF THE TYPE COMPRISING AT LEAST ONE SILICON LAYER DEPOSITED ON AN INSULATING SUBSTRATE

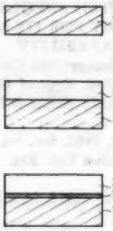
Michel Croset, Palaiseau; Dominique Dieumegard, Mareil-Marly, and Didier Pribat, Paris, all of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 8, 1984, Ser. No. 587,641

Claims priority, application France, Mar. 11, 1983, 83 04051

Int. Cl.³ H01L *21/20, 21/76*

U.S. Cl. 148—175 **6 Claims**



1. A process for manufacturing a semi-conductor device comprising a step for depositing at least one layer of monocrystalline silicon on a flat substrate made from an insulating material, comprising a subsequent step for forming by oxidation a layer of silica of given thickness buried within the layer of monocrystalline silicon, one of the faces of the silica layer being in direct contact with one of the faces of the substrate, wherein the substrate is made from a monocrystalline material selected from those having a crystalline network topology of the same type as that of the silicon and chemically inert with respect to the silicon and materials used for depositing said silicon layer and wherein, with the depositing step comprising heat treatment at a temperature higher than the ambient temperature, the subsequent oxidation step takes place after this treatment by exposure to an oxygen containing environment during the time required for returning to ambient temperature, wherein the material forming said substrate is chosen from those having exclusive ionic conduction of the oxygen ion and the step forming the silica is achieved by oxidation of the silicon through the material forming the substrate by means of ionic conduction of the oxygen ions through said material in the region in contact with the surface of the substrate over said given thickness.

4,540,453

MAGNETICALLY SOFT FERRITIC FE-CR-NI ALLOYS

Chester M. Boredelon, Shreveport, La.; Gilbert Y. Chin, Berkeley Heights; Sungho Jin, Meyersville; Richard C. Sherwood, New Providence, and Jack H. Wernick, Madison, all of N.J., assignors to AT&T Technologies, Berkeley Heights and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Filed Oct. 28, 1982, Ser. No. 437,199

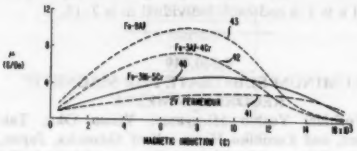
Int. Cl.³ H01F *1/04*

U.S. Cl. 148—31.55 **20 Claims**

1. Device comprising a magnetically soft alloy body, the alloy having a coercive force H_c of no more than about 3.0 Oe and a maximum permeability μ_m of at least about 1,500 G/Oe, both measured at room temperature,

characterized in that

(a) the alloy comprises at least about 82 weight percent Fe, between about 3 and about 10 weight percent Cr, between about 2 and about 8 weight percent Ni, and



(b) the alloy has a multiphase structure comprising α-phase material, with the amount of non-α-phase material present in the alloy body being at least about 5 volume percent.

4,540,454

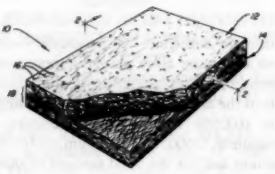
METHOD OF FORMING A SUPERTHIN ABSORBENT PRODUCT

Heinz A. Pieniak, North Brunswick, and Michael J. Iskra, Flemington, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Division of Ser. No. 439,963, Nov. 8, 1982, Pat. No. 4,500,315. This application Sep. 10, 1984, Ser. No. 648,445

Int. Cl.³ A61F *13/00;* **B32B** *5/02*

U.S. Cl. 156—62.2 **1 Claim**



1. A method for forming a disposable absorbent compressed composite comprising forming a fibrous web having a dry bulk recovery of at least about 60 percent, an initial dry bulk of at least about 20 cc/gm, and a weight of less than about 2 oz/yd^2, interspersing therein superabsorbent material arranged so as not to gel block and present in an amount between about 200 percent and about 1,500 percent dry weight basis based on said fibrous web dry weight basis to form an absorbing layer, contacting a wicking layer comprised of particles selected from the group consisting of cellulosic fibers, peat moss, and mixtures thereof with one surface of said absorbing layer and, compressing said layers sufficiently to reduce the thickness thereof by at least 50 percent and in the presence of at least about 10 percent moisture so that at least some of the particles of the wicking layer extend into and become integral with the fibrous web and wherein upon contact with liquid the compressed composite regains at least 75 percent of its thickness in uncompressed form.

4,540,455

METHOD OF MANUFACTURING LAMINATED FOAM PLASTICS MATERIALS

William D. Brewer, 573, Walmersley Rd., Bury, Lancashire, England

Filed Mar. 23, 1984, Ser. No. 592,712

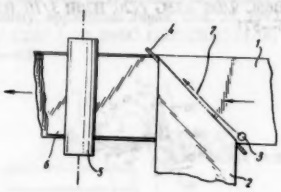
Claims priority, application United Kingdom, Mar. 31, 1983, 8309033; European Pat. Off., Jun. 16, 1983, 83303500.9

Int. Cl.³ B32B *31/12, 5/20*

U.S. Cl. 156—79 **10 Claims**

1. A method of manufacture of laminated material, comprising the steps of:

arranging a barrier in spaced relation to a first sheet material,
applying a quantity of unfoamed prepolymer onto said first sheet material adjacent an edge of the material,
causing the first sheet and prepolymer to pass adjacent said barrier,
allowing the prepolymer to foam as it passes adjacent the barrier, and



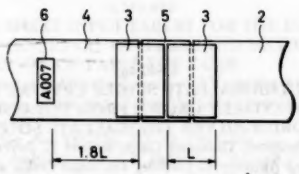
allowing the foam to cure to form a laminated material,
wherein the barrier is disposed obliquely to the direction of passage of said first sheet material,
and wherein the said quantity of the prepolymer is applied onto said first sheet material upstream of the most upstream part of the barrier.

4,540,456

FILM HANDLING METHOD

Shinichi Kaida, and Kaoru Uchiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 9, 1984, Ser. No. 629,291
Claims priority, application Japan, Jul. 7, 1983, 58-123936
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—159 **4 Claims**



1. In film processing method in which a troubled film strip spliced to a preceding film with a splicing tape is removed, the improvement wherein said troubled strip is removed by cutting along a line located inwardly of a leading end of said troubled film strip by a distance at least equal to the width of said splicing tape from a center line of a splice between said troubled film strip and a preceding film so that a part of said troubled film strip remains connected to said preceding film strip; and a succeeding film strip is spliced to said part of said troubled film strip.

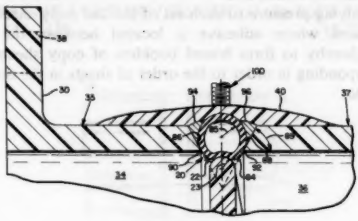
4,540,457

BUTTERFLY VALVE WITH PRESSURIZED O-RING SALE

Richard W. LaValley, Vancouver, Wash., assignor to LaValley Industrial Plastics, Inc., Vancouver, Wash.

Filed Mar. 9, 1983, Ser. No. 473,642
Int. Cl.³ F16K *1/226*
U.S. Cl. 156—182 **12 Claims**

1. A method of making a butterfly valve, comprising:
forming a fiberglass-reinforced plastic valve body having a wall means including an inner wall defining a passageway through the valve body;
forming a fiberglass-reinforced plastic blade with a periphery contoured to conform to the inner wall for closing the passageway; and
forming a seal in the wall means for sealing against the periphery of the blade all around the passageway;
the steps of forming said body and said seal including:
forming the valve body in two tubular sections separated from one another at opposed end faces; forming the end faces so that, together, they define a seat for retaining said seal between said end faces;



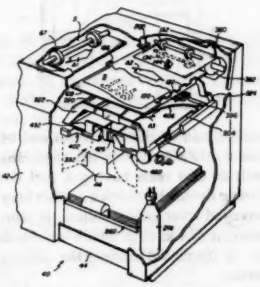
positioning the two sections in a predetermined spaced relationship abutting opposite sides of the seal to form said seat; and
applying a fiberglass-reinforced plastic overlay externally across the seal circumferentially of the valve body structurally to join the two sections into a unitary fiberglass valve body and to secure the seal in the seat.

4,540,458

ADHESIVE BINDING METHOD FOR SERIATIM FED SHEETS

Richard C. Baughman, Geneseo; David S. Bump, Rochester, and Charles R. Hubbard, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 380,966, May 24, 1982, Pat. No. 4,473,425.
This application May 21, 1984, Ser. No. 612,220
Int. Cl.³ C09J *5/00*
U.S. Cl. 156—312 **17 Claims**



1. A method for producing collated sets of copy sheets from a set of document sheets and for adhesively binding each set of copy sheets into a booklet, the method comprising the steps of:
circulating a set of document sheets arranged in page sequential order seriatim a plurality of times to a document imaging station;
copying each document sheet once each time it is circulated to the imaging station, thereby producing a stream of copy sheets to form sets having a page sequence corresponding to the set of document sheets;
advancing the stream of copy sheets initially in a first direction with the trailing edge of each copy sheet comprising the edge that is to be bound to other sheets and then

advancing the stream of sheets in a second direction with the sheet edge to be bound to other sheets being located along one side edge thereof;

applying a stripe of liquid adhesive to copy sheets and stacking each set of copy sheets in the same order as the set of document sheets with adhesive being applied so that there is adhesive between adjacent copy sheets in a set of copy sheets, the adhesive being applied to such one side edge of the copy sheets while the sheets are advanced in the second direction; and

applying pressure to each set of stacked copy sheets in the area where adhesive is located between the sheets, thereby to form bound booklets of copy sheets corresponding in order to the order of sheets in the document set.

4,540,459

DEVICE FOR JOINING THE PAYED-OUT END OF A STRIP, WHICH HAS BEEN WOUND INTO A REEL, WITH THE BEGINNING OF THE STRIP OF ANOTHER REEL

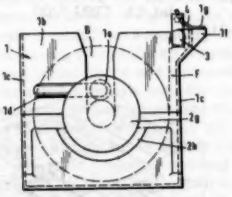
Iain G. H. Stewart, Wuppertal, and Hans P. Pitz, Gevelsberg, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Fr. Niepmann GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Filed Jan. 19, 1984, Ser. No. 572,208

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302309

Int. Cl.³ B65H *19/12, 19/14, 21/00*

U.S. Cl. 156—504 **20 Claims**



1. A device for joining the payed-out end of a strip, which had been wound into a reel, with the beginning of a strip of a new reel, each of said reels having a reel core; said device includes a storage device in which a certain length of said strip, which is conveyed over guide rollers, is stored, and out of which that amount of said strip which is necessary for continuous operation is dispensed during the joining process; said device comprises:

a respective cartridge for each reel; each cartridge has two wide sides, with each reel being disposed in its cartridge by being mounted on said wide sides thereof by means of a spindle which passes through its reel core and extends laterally out of said cartridge; means are disposed in said spindle for securing each reel against rotation during transport of its cartridge; each cartridge is provided with a support surface for receiving said strip beginning of a reel, with said strip beginning being adapted to be held firmly in place on said support surface; and

a separating and binding device for receiving cartridges with full reels, and from which cartridges with empty reels can be withdrawn; said separating and binding device effects said joining of said strip end and said strip beginning.

4,540,460

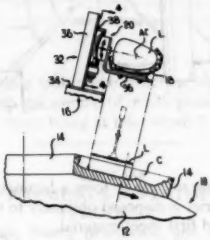
SLEW CONTROL MOUNTING DEVICE FOR LABEL MAGAZINE

Leonard A. Blomquist, Joliet, and John Avery, Matteson, both of Ill., assignors to Continental Packaging Company, Inc., Stamford, Conn.

Filed Jan. 20, 1984, Ser. No. 572,337

Int. Cl.³ B65C *9/08;* **A23G** *1/20;* **B20B** *3/10;* **B29C** *27/14*

U.S. Cl. 156—571 **11 Claims**



1. A mounting device comprising a label magazine for supporting a label having a center, and a slewable mounting unit carrying said label magazine and forming means for adjustably slewing said label magazine about center.

4,540,461

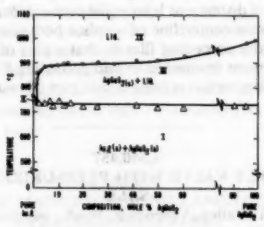
SILVER THIOGALLATE SINGLE CRYSTAL LAYERS EPITAXIALLY GROWN FROM POTASSIUM CHLORIDE-SILVER THIOGALLATE SOLUTION

Sanat K. Sashital, Thousand Oaks; Robert L. Joyce, Newbury Park, and Anthony L. Gentile, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Apr. 30, 1984, Ser. No. 605,359

Int. Cl.³ C30B *19/02*

U.S. Cl. 156—624 **9 Claims**



1. A method of making a single crystal of silver thiogallate comprising the steps of:

(a) preparing a liquid solution of silver thiogallate in potassium chloride;

(b) placing in the solution a seed crystal which has a proper lattice parameter relationship with silver thiogallate; and

(c) slowly cooling the solution to form on the seed crystal a thin layer of a single crystal of silver thiogallate.

4,540,462

SUBSTRATE FOR SEMICONDUCTOR MODULES AND METHOD OF MANUFACTURE

Nobuyuki Mizunoya; Hajime Kohama, and Yasuyuki Sugiura, all of Kanagawa, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Dec. 6, 1983, Ser. No. 558,583
Claims priority, application Japan, Dec. 23, 1982, 57-230399
Int. Cl.[3] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—630 16 Claims

1. A method of manufacturing a substrate having a predetermined copper pattern for a semiconductor module comprising the steps of:

providing a ceramic plate;

providing a copper sheet;

putting the copper sheet on a surface of the ceramic plate;

bonding the copper sheet to the ceramic plate surface by heating them;

forming the predetermined pattern on the copper sheet; and

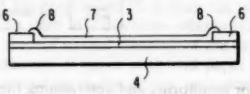
etching the copper sheet in accordance with the predetermined pattern to form the substrate.

4,540,463

RESISTOR SHEET INPUT TABLET FOR THE INPUT OF TWO-DIMENSIONAL PATTERNS AND METHOD FOR PRODUCTION OF PARTS FOR SAME

Takeshi Kakuhashi; Hiroshi Tahara, and Yoshihisa Mori, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 515,228, Jul. 19, 1983, Pat. No. 4,517,546.
This application Nov. 5, 1984, Ser. No. 668,434
Claims priority, application Japan, Jul. 19, 1982, 57-126069
Int. Cl.[3] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—630 5 Claims



1. A method for the production of a resistor sheet for an input tablet comprising:

(1) depositing a thin metal film as a main resistor layer on one side of a highly electrically conductive plate,

(2) bonding an electrically insulating layer to the surface of said thin metal film,

(3) masking the opposite edges of said highly electrically conductive plate which are reserved for the subsequent formation of electrodes thereon,

(4) simultaneously etching out said highly electrically conductive plate, thereby exposing said thin metal film, and forming electrodes of the resistor sheet at said masked edges, and

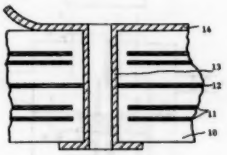
(5) coating the exposed surface of said metal film on the resistor sheet with a protective resistor layer.

4,540,464

METHOD OF RENEWING DEFECTIVE COPPER CONDUCTORS ON THE EXTERNAL PLANES OF MULTILAYER CIRCUIT BOARDS

Harald Mueller, Grafenau, and Friedrich Schwerdt, Herrenberg, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,082
Claims priority, application European Pat. Off., May 19, 1983, 831049572
Int. Cl.[3] C23F 1/02; B44C 1/22; C23C 15/00; B05D 5/12
U.S. Cl. 156—639 15 Claims



1. A method of renewing defective copper conductors on the external plane of a multilayer circuit board, comprising the following process steps:

(1) pre-processing of the multilayer circuit board by

(a) cleaning, and rinsing;

(b) removing oxidic layers from the copper to be etched, and rinsing;

(2) etching off the defective copper conductors, and etching the copper on the wall of a through hole, with an etching rate continuously decreasing toward the center of the hole wall, and rinsing;

(3) applying an activating layer of copper on the surface of the substrate, and on the adjacent parts of the wall of the through hole; and

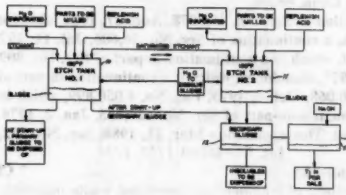
(4) depositing copper conductors on the surface regions of the activating layer defined by a photoresist mask and depositing copper on the entire surface of the through hole wall.

4,540,465

PROCESS FOR CONTINUOUS RECOVERY OF NITRIC ACID/HYDROFLUORIC ACID TITANIUM ETCHANT

Dolphus L. Coggins, St. Louis, and Walter E. Lindner, St. Louis County, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jun. 11, 1984, Ser. No. 619,224
Int. Cl.[3] C23F 1/00; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—642 8 Claims



1. A process for chemically milling titanium and its alloys comprising:

(a) forming a chemically milling solution saturated in titanium in a first etch tank;

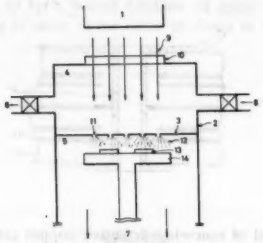
(b) immersing titanium containing parts in the solution while maintaining the solution saturated in titanium; and

(c) forming a water soluble precipitate in the tank;

4,540,466
METHOD OF FABRICATING SEMICONDUCTOR DEVICE BY DRY PROCESS UTILIZING PHOTOCHEMICAL REACTION, AND APPARATUS THEREFOR

Jun-ichi Nishizawa, Sendai, Japan, assignor to Semiconductor Research Foundation, Sendai, Japan

Filed Apr. 26, 1984, Ser. No. 604,118
Claims priority, application Japan, May 11, 1983, 58-82368
Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C23F** *1/02;* **B05D** *3/06*
U.S. Cl. 156—643 **21 Claims**



1. A dry process for fabricating a semiconductor device by utilizing photochemical reactions using a reactant gas fed into a vessel housing therein a semiconductor substrate to perform etching of or deposition onto said substrate, comprising:

establishing, in said vessel, a higher pressure gas first region and an adjacent lower pressure gas second region communicating with said first region by at least one gas passageway formed therebetween to produce a difference in pressure of the gas between the first and second gas regions, causing a flow of said gas from said first region into said second region through said gas passageway;

placing said substrate in a region in said vessel wherein there exsists a low pressure of said gas;

irradiating at least one beam of light rays onto the gas supplied into said first region to activate particles contained in said gas; and

transporting the resulting activated gas-phase particles from the first region into the second region as they are carried in said flow of gas to be distributed onto said substrate placed in said second region,

whereby performing said etching of or deposition onto the substrate.

4,540,467
METHOD FOR FRAGMENTING MUNICIPAL SOLID WASTES

Kenneth E. Grube, 150 Anchorage Cir.; Vincent E. Harrington, and James V. Harrington, both of 19 Dolphin Rd., all of Groton, Conn. 06340

Continuation of Ser. No. 412,078, Aug. 27, 1982, abandoned, which is a continuation of Ser. No. 56,606, Jul. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 809,791, Jun. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 620,068, Oct. 6, 1975, Pat. No. 4,050,899, which is a continuation-in-part of Ser. No. 429,733, Jan. 2, 1974, abandoned. This application Mar. 21, 1984, Ser. No. 592,723
Int. Cl.³ D21B *1/32, 1/36*
U.S. Cl. 162—4 **7 Claims**

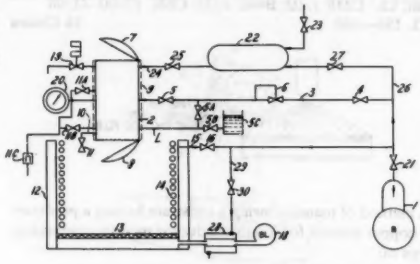
1. A method of fragmenting municipal waste materials part of which will absorb moisture and are frangible, and includes at least paper material as one ingredient, and part of which are non-frangible material selected from the group consisting of metals and plastics but which are associated with the frangible material, comprising the steps of:

(a) compiling frangible waste materials to be fragmented and any associated non-frangible materials in a vessel,

(b) introducing into the material-containing vessel a liquid bath including an aqueous solution of a wetting agent enhancing penetration of at least one of the frangible materials by the bath, to thereby facilitate separation of constituents in the frangible materials,

(c) soaking the material in the baths for a predetermined period of time,

(d) draining the vessel of excess liquid,



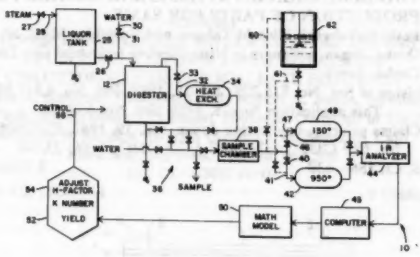
(e) pressurizing and heating the interior of the vessel and its content with steam of at least 212° F. and at a predetermined pressure in a range of about 30 to 90 psi and

(f) suddenly depressurizing the vessel interior and its contents to cause fragmentation of the frangible material.

4,540,468
METHOD FOR DETERMINING THE DEGREE OF COMPLETION AND PULP YIELD

Joseph M. Genco, and John C. Hassler, both of Orono, Me., assignors to Board of Trustees of the University of Maine, Bangor, Me.

Filed Sep. 26, 1983, Ser. No. 535,922
Int. Cl.³ D21C *7/12*
U.S. Cl. 162—49 **19 Claims**



1. In a method for monitoring and determining the degree of completion and pulp yield of a pulping or delignification reaction for a known quantity of starting wood or pulp of known carbon content immersed and reacting in a process liquor of known starting carbon content at a known liquor to wood or pulp ratio the improvement comprising:

sampling the liquor during the reaction;

measuring the total organic carbon content of the sampled liquor during the reaction;

calculating the degree of completion of the reaction and pulp yield from the process liquor total organic carbon content measurement using a conservation of carbon mass mathematical model based upon conservation of carbon mass in the wood or pulp and liquor during the reaction, said mathematical model including a conservation of mass equation in which the total organic content in the sampled liquor substantially equals the total carbon content in the starting quantity of wood or pulp less the total carbon

content of wood residue at the time of sampling the black liquor, said mathematical mode providing the calculation of the degree of completion and pulp yield based upon the sampled liquor total organic carbon measurement without requiring sampling of the wood or pulp residue of the pulping or delignification reaction;

controlling the reaction in real time according to the calculated degree of completion and pulp yield of the reaction; and terminating the reaction when the reaction reaches the desired degree of completion and pulp yield calculated by the conservation of carbon mass mathematical model applied to the sampled liquor total organic carbon measurement.

4,540,469

METHOD OF CLEANING A DRYING WIRE IN A PAPER MAKING MACHINE

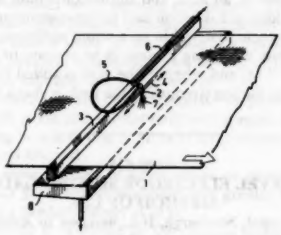
Kristian V. Lundström, Pirkkala, Finland, assignor to Tamefelt Oy AB, Finland

Continuation of Ser. No. 348,765, Feb. 16, 1982, abandoned, which is a continuation of Ser. No. 148,936, May 12, 1980, abandoned. This application Mar. 1, 1984, Ser. No. 585,597

Claims priority, application Finland, May 16, 1979, 791564

Int. Cl.³ D21F *1/32*

U.S. Cl. 162—199 **8 Claims**



1. A method of cleaning a drying wire in a drying section of a paper making machine by subjecting the surface of the drying wire to at least one pressurized water jet, wherein the drying wire is formed with a transverse joint or seam preventing the use of suction boxes to remove water therefrom, comprising the steps of maintaining the water jet at a pressure selected within a pressure range of approximately 430 psi to approximately 1300 psi to produce a pressurized water flow; impinging the pressurized flow from the water jet onto the drying wire so that the pressurized flow from the water jet impinges on the drying wire in a direction substantially orthogonal to the surface thereof so that cleaning of the drying wire occurs during production of paper with said paper making machine and water remaining in the drying wire does not disturb the web formation; wherein the pressurized flow volume increases at progressively higher pressures while the amount of water remaining in the drying wire decreases at progressively higher pressures within said pressure range; and reciprocating the water jet transversely along the drying wire.

4,540,470

DISTILLED WATER PRODUCTION DEVICE

Mitsuharu Wakasugi, Koshigaya, Japan, assignor to Yamamoto Scientific Co., Ltd., Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,816

Claims priority, application Japan, May 20, 1983, 58-74621[U]

Int. Cl.³ B01D *3/42*

U.S. Cl. 202—180 **7 Claims**

1. A distilled water production device comprising:

a boiler for producing steam,

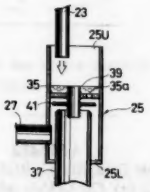
a condenser for condensing the steam supplied from said boiler by means of cooling water,

means for supplying the cooling water to said condenser,

an outflow path for the cooling water connected to said condenser,

an overflow tube provided along said outflow path and divided into an upper chamber and a lower chamber by a flow dividing plate, said upper chamber receiving cooling water from said outflow path,

means for discharging excess cooling water from inside of said upper chamber comprising a pipe passing through said dividing plate from said upper chamber to said lower chamber and communicating between said upper chamber



and said lower chamber so as to keep the height of the cooling water retained in said upper chamber constant,

said flow dividing plate being formed with at least one hole through which the cooling water falls from said upper chamber into said lower chamber at a predetermined rate of flow, and

means for supplying cooling water to said boiler from said lower chamber.

2. A distilled water production device according to claim 1, wherein,

said pipe is threadably engaged with a thread formed on said dividing plate so that the vertical position of said pipe can be adjusted.

4,540,471

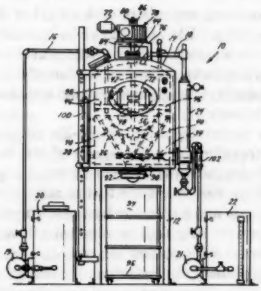
SOLVENT DISTILLATION UNIT WITH ADJUSTABLE SCRAPERS

Donald G. Fluchel, St. Louis, Mo., assignor to Progressive Recovery, Inc., St. Louis, Mo.

Filed Jun. 25, 1984, Ser. No. 624,145

Int. Cl.³ B01D *21/14, 21/22*

U.S. Cl. 202—175 **19 Claims**



13. A solvent distillation unit comprising a vessel into which contaminated solvent is introduced, said vessel having a heat exchange surface for heating said solvent, at least a portion of said surface at the bottom of said vessel being conical, scraper means internally of said vessel for preventing excessive accumulation of solids on the internal surface of said conical heat

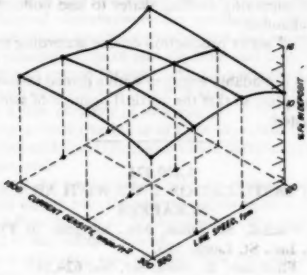
exchange surface during distillation, said scraper means having blades conforming to the conical surface, a vertical drive shaft extending downwardly through the top of the vessel, means for mounting said blades to said drive shaft for rotation about a vertical axis, drive means for rotatably driving said shaft to rotate said scraper blades during distillation, and means for vertically adjusting said shaft externally of said vesel to thereby adjust the contact of said scraper blades with said conical heat exchange surface without the need for access inside the vessel.

4,540,472

METHOD FOR THE ELECTRODEPOSITION OF AN IRON-ZINC ALLOY COATING AND BATH THEREFOR

William R. Johnson, Trafford, and Larry E. Pfister, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 3, 1984, Ser. No. 677,423
Int. Cl.³ C25D *3/56, 5/04*
U.S. Cl. 204—28 **8 Claims**



1. An electrolyte for the electrodeposition of an Fe-Zn alloy coating, consisting essentially of 4–10 g/l of Fe^{2+}, 50–80 g/l Zn^{2+}, 240–300 g/l Cl^-, 6–12 g/l SO_4^{2-}, 0.05–5 g/l of a chelating agent in an amount sufficient to prevent the formation of ferric ion precipitates, 0.5 to 2 ml/l of an adduct containing one or more polyalkylene glycols having a molecular weight of 600–1050, balance H_2O.

5. In the electrodeposition of Fe-Zn alloy coatings onto a steel strip travelling at a line speed of 100 to 500 ft/min., in which such deposition is effected by supplying a current density of 400 to 1600 amps/ft^2 to the strip through a soluble zinc-base anode and a chloride-base electrolyte which is circulated between the strip and the anode at a flow-rate sufficiently high to support such current density,

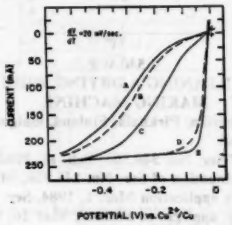
the improvement for effecting the electrodeposition of a lustrous Fe-Zn coating containing 10 to 20% Fe over said line speed range and said current density range, wherein the electrolyte is maintained at a temperature of 130° to 160° F. and consists essentially of 4–10 g/l of Fe^{2+}, 50–80 g/l Zn^{2+}, 240–300 g/l Cl^-, 6–12 g/l SO_4^{2-}, 0.5–5 g/l of a chelating agent in an amount sufficient to prevent the formation of ferric ion precipitates, 0.5 to 2 ml/l of an adduct containing one or more polyalkylene glycols having a molecular weight of 600–1050, balance H_2O.

4,540,473

COPPER PLATING BATH HAVING INCREASED PLATING RATE, AND METHOD

Perminder S. Bindra, Ossining; Allan P. David; Raymond T. Galasco, both of Binghamton; Charles E. Gasdik, Endicott; David N. Light, Briarcliff Manor, and Paul B. Pickar, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 22, 1983, Ser. No. 554,484
Int. Cl.³ C25D *3/38*
U.S. Cl. 204—52 R **16 Claims**



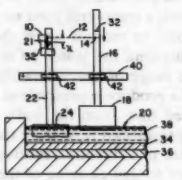
1. An acidic-electrolytic copper plating bath comprising a cupric ion source, an acid, and sulfur-containing anions other than sulfate ions and wherein said sulfur-containing anions are from an inorganic material in an amount sufficient to increase the plating rate and being present in an amount of about 10^{-6} to about 10^{-3} M, and wherein the acid is added in an amount sufficient that the ion strength of the bath is about 5 to about 9 M.

4,540,474

LIGHT LEVEL ELECTRODE SETTING GAUGE AND METHOD OF USE

Robert L. Voegel, Newburgh, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 4, 1984, Ser. No. 617,078
Int. Cl.³ C25C *3/00, 3/06*
U.S. Cl. 204—67 **5 Claims**



1. A method of setting anodes in an electrolytic cell, comprising the steps of:

providing a mark on rods that support respective anodes in an electrolytic cell after each of the rods and anodes are newly assembled together, the location of the marks being equidistant from the bottom surface of each of the anodes,

placing a first anode and rod of the newly assembled anodes and rods in the circuit of the cell such that a portion of the anode is consumed in the cell over a period of time,

lowering the anode and rod in the cell a distance equal to the portion of the anode consumed,

placing a second newly assembled anode and rod in the cell,

placing a light source on the rod of the first anode adjacent the mark provided thereon,

directing a beam of light horizontally from the source to the rod of the second anode in a manner that provides a narrow light image on said rod and at a location thereon that is vertically displaced above the mark on the first rod by a distance equal to the amount of anode consumption, and

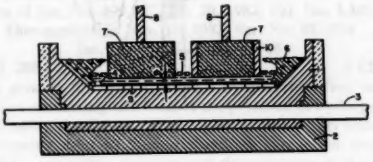
adjusting the vertical position of the second rod and anode such that the mark provided on the second rod is located at the vertical position of the light image on the rod.

4,540,475

ELECTROLYTIC AL PRODUCTION WITH REACTIVE SINTERED CERAMIC COMPONENTS OF BORIDE-OXIDE PHASES

Thomas P. DeAngelis, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,672
Int. Cl.³ C25C *3/06, 3/08;* C04H *35/58*
U.S. Cl. 204—67 **16 Claims**



1. A component of an electrolytic aluminum production cell which in use is normally in contact with molten aluminum or in electrical contact with another component which is normally in contact with molten aluminum, characterized in that it has a surface and/or inner portion made of a reaction sintered oxide-boride ceramic consisting essentially of a fine-grained, homogeneous, intimate interdispersion of:

(a) 10–90 mole percent of boride phase or phases having a maximum grain size substantially not greater than 15 μm and being boride of one or more of the elements of Groups 4b, 5b and 6b, and

(b) 10–90 mole percent of oxide phase or phases having a maximum grain size substantially not greater than 15 μm and being predominantly Al_2O_3;

which ceramic is prepared by the process comprising:

(c) admixing particulate reactants of maximum particle size substantially not greater than 150 μm and being elements, compounds, intermetallic compounds, alloys or combination thereof in stoichiometric proportions to substantially form the boride and oxide phases, and

(d) shaping and heating the admixture to form the reaction sintered ceramic, the heating being done in nonreactive atmosphere and at temperature at which the reaction and sintering occurs between the reactants to substantially form the boride and oxide phases.

16. A method of producing aluminum by electrolysis in an electrowinning or electrorefining cell characterized by the method being performed in the cell having a cell component as claimed in claim 1.

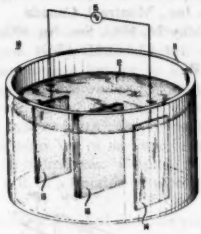
4,540,476

PROCEDURE FOR MAKING NICKEL ELECTRODES

Christopher K. Dyer, Summit, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 448,638, Dec. 10, 1982, abandoned. This application Dec. 5, 1984, Ser. No. 678,225
Int. Cl.³ C25B *1/00*
U.S. Cl. 204—96 **12 Claims**

1. A process for the fabrication of an aqueous battery cell in which the battery cell comprises at least one nickel electrode characterized in that the nickel electrode is made by a procedure comprising the step of exposing a conducting nickel structure to alternate anodic and cathodic potentials in an electrolytic solution with conductivity greater than 0.001 mho-cm, said alternating anodic and cathodic pulses occurring at a frequency between 0.01 and 100 Hz and which comprises ions that enhance dissolution of metallic nickel from the conducting nickel structure and cathodically reduce water to produce a sufficiently high hydroxide concentration to precipitate the anodically oxidized metallic nickel as active material and in which the conducting nickel structure is a porous nickel



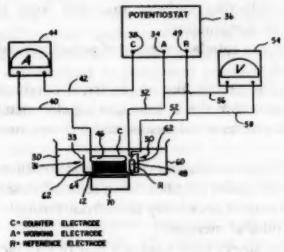
plaque, and the nickel in the active material originates only from the porous nickel plaque.

4,540,477

APPARATUS FOR PRODUCING ACICULAR OR EQUIAXED IRON OR IRON ALLOY PARTICLES

Lifun Lin, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 499,009, May 27, 1983, Pat. No. 4,465,264. This application Jan. 12, 1984, Ser. No. 570,120
The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.
Int. Cl.³ C25C *7/00;* C25F *7/00*
U.S. Cl. 204—242 **9 Claims**



1. An apparatus for collecting ferromagnetic equiaxed particles distributed in metal or metal alloy material, comprising:

means for electrochemically dissolving said metal or metal alloy material without substantial dissolving of said ferromagnetic particles, said means for electrochemically dissolving including:

a tank containing an electrolyte;

support surface means in said tank, said support surface means being electrically conductive and in electrical contact with the dissolving metal or metal alloy material;

a working electrode comprising said support surface means and the metal or metal alloy material;

a counter electrode disposed in said tank;

means for passing an electrical current between said working electrode and said counter electrode; and

magnetic field forming means associated with said support surface means for magnetically adhering dissolved ferromagnetic particles and pieces of metal or metal alloy material having undissolved ferromagnetic particles distributed therein to said support surface means so as to enhance the dissolution of the metal or metal alloy material and maximize recovery of said equiaxed ferromagnetic particles.

4,540,478

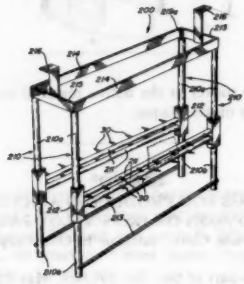
PLATING RACK

Horst Mallok, Ville St. Laurent; Howard Brown, Pointe Claire, and Marco Iacampo, Montreal, all of Canada, assignors to RDC Electronics Inc., Montreal, Canada

Filed May 24, 1983, Ser. No. 497,690

Int. Cl.³ C25D *17/04*

U.S. Cl. 204—297 W **17 Claims**



1. A rack intented to be placed in a fluid, for use in plating a printed circuit board or other like article having a pair of electrical conducting surfaces insulated from one another, comprising in combination:

(a) at least one tubular member of non-electrical conducting material;

(b) a bus-bar or the like of electrical conducting material disposed within the at least one tubular member;

(c) at least one terminal means, said terminal means comprising;

(i) an elongated member of electrical conducting material, said elongated member being secured to said bus-bar so as to extend outwardly therefrom through a portion of said tubular member;

(ii) a first sleeve such having a pair of end faces and comprising electrical conducting material, said first sleeve being over a first portion of said elongated member and engageable with said bus-bar;

(iii) a second sleeve such having a pair of end faces and comprising electrical conducting material, said second sleeve being over a second portion of said elongated member;

(iv) a third sleeve such having a pair of end faces and comprising non-electrical conducting material, said third sleeve being slideable over said first sleeve;

(v) a fourth sleeve such having a pair of end faces and comprising non-electrical conducting material, said fourth sleeve being slideable over said second sleeve;

(vi) means associated with said elongated member providing clamping action whereby to clamp an article with said first and second sleeves while said article is on said elongated member and located intermediate said first and second sleeves, said means while providing said clamping action urging said third and fourth sleeves toward said article; and

(d) seal means associated with said terminal means for preventing said fluid coming into contact with said bus-bar and said first sleeve comprising electrical conducting material.

4,540,479

OXYGEN SENSOR ELEMENT WITH A CERAMIC HEATER AND A METHOD FOR MANUFACTURING IT

Shigenori Sakurai; Takashi Kamo, and Toshinobu Furutani, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 30, 1982, Ser. No. 431,366

Claims priority, application Japan, Mar. 26, 1982, 57-48367

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—427 **11 Claims**

1. An oxygen sensor element having a ceramic heater, said oxygen sensor element comprising:

(a) a hollow, cylindrical sensor element body made of an oxygen permeable material, said sensor element body having one closed end and one open end;

(b) inner and outer electrodes provided on the inner and outer surface of said sensor element body, respectively;

(c) a fitting member made of metal, said fitting, member being mounted in the open end of said sensor element body in electrical contact with said inner electrode, said fitting member having an axial opening therethrough;

(d) a ceramic heater mounted in the axial opening in said fitting member, said ceramic heater having a first end and a second end, the first end of said ceramic heater axially projecting from said fitting member into said hollow, cylindrical sensor element body, said ceramic heater comprising:

(i) a bar-like ceramic core, said bar-like ceramic core having an axial opening therethrough for introducing a reference gas into the inside of said hollow, cylindrical sensor element body so as to be in contact with said inner electrode;

(ii) a ceramic layer disposed around said ceramic core and in contact with the outer surface of said ceramic core;

(iii) a metallized layer formed on a portion of the outer surface of said ceramic layer, said ceramic heater being joined to said fitting member by brazing said metallized layer to said fitting member, thereby longitudinally positioning said ceramic heater; and

(iv) a heating member hermetically sealed between said ceramic core and said ceramic layer, said heating member having a heating portion positioned near the end of said ceramic heater remote from said fitting member; and

(e) first means for exposing said outer electrode to a gas the oxygen content of which is to be sensed.

4,540,480

PROCESS FOR PREPARING HYDROGENATED PETROLEUM RESIN

Noriharu Azuma, Suita, and Shigeru Suetomo, Kobe, both of Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1983, Ser. No. 544,230

Claims priority, application Japan, Oct. 23, 1982, 57-186496; Jan. 26, 1983, 58-11684

Int. Cl.³ C10C *3/00, 3/02*

U.S. Cl. 208—44 **13 Claims**

1. A process for preparing a hydrogenated petroleum resin which comprises parallel-currently passing hydrogen gas and a feed stock consisting essentially of petroleum resin having an

aromatic ring in a molten state through a fixed bed of a supported catalyst containing as a catalytically active material a metal selected from the group consisting of platinum, rhodium, a combination thereof and a combination of at least one of platinum and rhodium with at least one of palladium, ruthenium and rhenium and withdrawing the hydrogenated petroleum resin from the fixed bed in a molten state.

4,540,481

CATALYSTS FROM MOLYBDENUM POLYSULFIDE PRECURSORS, THEIR PREPARATION AND USE

Willard H. Sawyer, and Howard L. Mitchell, III, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 399,947, Jul. 20, 1982, Pat. No. 4,430,442. This application Nov. 14, 1983, Ser. No. 551,594

Int. Cl.³ C10G *45/04, 45/08*

U.S. Cl. 208—215 **8 Claims**

1. A process for hydrotreating a hydrocarbon feed which comprises contacting said feed, in the presence of hydrogen, at hydrotreating conditions with a highly active, highly selective hydrotreating catalyst characterized as a reaction product formed by contacting together and decomposing in the presence of hydrogen, hydrocarbon, and sulfur, a catalyst precursor salt characterized by the formula

$$B_x[Mo_3S_z]$$

where

B is an ammonium ion, polyammonium ion, tertiary or quaternary phosphonium ion, or a hydrocarbyl substituted ammonium ion, hydrocarbyl substituted polyammonium ion, or hydrocarbyl substituted tertiary or quaternary phosphonium ion,

x is 1 where B is a divalent cationic moiety, or 2 where B is a monovalent cationic moiety,

$[Mo_3S_z]$ is a divalent anionic moiety wherein z is an integer ranging from about 10 to about 46.

4,540,482

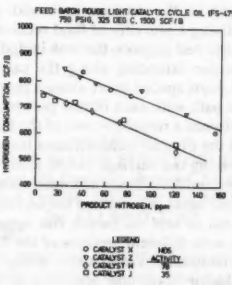
SUPPORTED CARBON-CONTAINING MOLYBDENUM AND TUNGSTEN SULFIDE CATALYSTS, THEIR PREPARATION AND USE

Robert L. Seiver, Baton Rouge, La., and Russell R. Chianelli, Sommerville, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 400,005, Jul. 20, 1982, Pat. No. 4,430,443. This application Nov. 14, 1983, Ser. No. 551,675

Int. Cl.³ C10G *45/04, 45/08*

U.S. Cl. 208—215 **10 Claims**



1. A process for hydrotreating a hydrocarbon feed which comprises contacting said feed, in the presence of hydrogen, at hydrotreating conditions with a supported carbon-containing molybdenum sulfide and tungsten sulfide hydrotreating catalysts formed by the steps comprising

compositing a preselected quantity of a porous, refractory inorganic oxide with a salt characterized by the formula

$$B_x[MO_yS_{4-y}]$$

where B is an organo or hydrocarbyl substituted diammonium ion, an organo or hydrocarbyl substituted ammonium ion or quaternary ammonium ion, or an ionic form of a cyclic amine containing one or more basic N atoms, x is 1 where B is an organo or hydrocarbyl substituted diammonium ion, or 2 where B is an organo or hydrocarbyl substituted ammonium or quaternary ammonium ion or an ionic form of a cyclic amine containing one or more basic N atoms, M is molybdenum or tungsten, and y is 0, or a fraction or whole number ranging up to 3, and

heat decomposing the salt of said catalyst precursor composite in the presence of a gaseous admixture consisting essentially of hydrogen and hydrogen sulfide to form said supported carbon-containing molybdenum sulfide or tungsten sulfide hydrotreating catalyst.

4,540,483

HYDROTREATING PROCESS

Howard D. Simpson, Irvine; Ryden L. Richardson, Whittier, and Paul K. Angmorter, Montclair, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 408,264, Aug. 16, 1982, Pat. No. 4,446,248. This application Dec. 29, 1983, Ser. No. 566,487

Int. Cl.³ C10G *45/08*

U.S. Cl. 208—216 PP **22 Claims**

1. A process for hydrodenitrogenating and/or hydrodesulfurizing a hydrocarbon feedstock containing organonitrogen and/or organosulfur compounds comprising the steps of:

(a) contacting said feedstock with hydrogen in the presence of a catalyst composition at elevated temperatures and pressures such that some of said organonitrogen and/or organosulfur compounds are converted to ammonia and/or hydrogen sulfide, thereby yielding a denitrogenated and/or desulfurized hydrocarbon product phase and an ammonia and/or hydrogen sulfide phase, said catalyst composition being comprised of molybdenum, nickel and phosphorous active components on support particles comprising gamma alumina, and said catalyst having been prepared by a method comprising the steps of (1) contacting said gamma alumina support particles with an aqueous solution containing ammonium hydroxide, (2) impregnating the resultant support particles with molybdenum, nickel and phosphorous, (3) calcining the impregnated particles at an elevated temperature in the presence of oxygen, and (4) sulfiding the calcined particles such that essentially all molybdenum and nickel components are converted to metal sulfides; and

(b) separating said hydrocarbon product phase from said ammonia and/or hydrogen sulfide phase.

4,540,484

METHOD AND APPARATUS FOR SEPARATING SELECTED PARTICULATE MATERIALS FROM A MIXTURE OF LIQUIDS AND SOLIDS

James R. McCarthy, 623 Nevin Ave., Sewickley, Pa. 15143

Division of Ser. No. 860,898, Dec. 15, 1977, Pat. No. 4,222,857. This application Nov. 1, 1979, Ser. No. 90,135

Int. Cl.³ B03B *1/04, 5/40*

U.S. Cl. 209—5 **22 Claims**

1. A method for separating selected particulate material from a mixture of liquids and solids, said method comprising the steps of:

(a) providing a trough shaped vessel having a mixture introducing end and a discharge end,

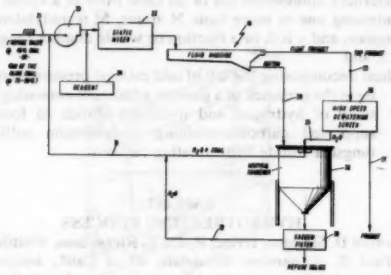
(b) said discharge end having an upper outlet means and a lower outlet means,

(c) providing a supply of a mixture of liquids and solids including a chemical reagent in an amount sufficient to

prepare a selected particulate material of said solids for separation from said mixture,

(d) feeding a continuous supply of said mixture at the mixture introducing end of the vessel at a rate sufficient to provide a continuous, substantially quiescent movement of the mixture through said vessel,

(e) maintaining the continuously moving mixture within said vessel for a period of time sufficient to allow said selected particulate material to collect at the upper surface of the mixture,



(f) providing an unimpeded discharge flow of material out of said vessel to cause a free flow of material at the upper surface of the liquid in said mixture,

(g) providing an impeded discharge flow of effluent material out of said vessel, wherein

the mixture is composed of water, bituminous coal values, ash and chemical reagent,

said chemical reagent includes zinc dithiophosphate and a liquid hydrocarbon, and

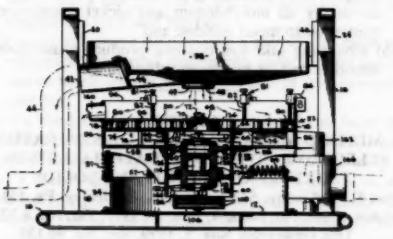
said bituminous coal values constitute said selected particulate material which floats at the surface of the liquid as the mixture moves through said vessel.

4,540,485

VIBRATORY SCREEN SEPARATOR

John Lanerie, P.O. Box 30198, 209 Guilbeau Rd., Lafayette, La. 70503

Filed Feb. 6, 1981, Ser. No. 232,407
Int. Cl.³ B07B *1/38, 1/54*
U.S. Cl. 209—323 **18 Claims**



1. In a vibratory separator apparatus of the type including a horizontally extending screen mounted on a vibratory support above a vibratory screen cleaning element supporting surface positioned beneath the screen, the improvement comprising a plurality of screen cleaning elements supported on said supporting surface with each of said screen cleaning elements comprising a single tubular member having a vertical longitudinal axis and a center of gravity offset with respect to its vertical longitudinal axis.

4,540,486

POLYETHYLENIMINE BOUND CHROMATOGRAPHIC PACKING

Hugh E. Ramsden, Scotch Plains, N.J., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Nov. 25, 1983, Ser. No. 555,368
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—198.2 **11 Claims**

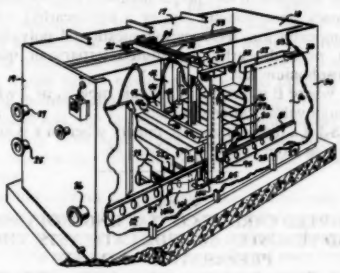
10. A chromatographic column suitable for liquid chromatography packed with covalently bound, non-crosslinked polyethylenimine reaction product of particulate silica gel having an average particle diameter of from about 5 to about 40 microns and an average pore size of from about 50 to about 300 Angstrom units with polyethyleniminopropyl trimethoxy silane having an average molecular weight of from about 400 to about 600, wherein the term non-crosslinked means that the imino and amino groups on adjacent covalently bound polyethylenimine moieties are not crosslinked, or reacted with a crosslinking agent, to form a polymeric layer.

4,540,487

FILTER APPARATUS

John K. Johnson, Stillman Valley; Jack R. Earhart, Roscoe; Gordon L. Astrom, Mount Morris, and Mark A. Herbig, Roscoe, all of Ill., assignors to Aqua-Aerobic Systems, Inc., Rockford, Ill.

Filed May 29, 1984, Ser. No. 614,948
Int. Cl.³ B01D *23/24, 23/16*
U.S. Cl. 210—264 **24 Claims**



1. A filter apparatus of the type including a tank, a filter bed support in the tank supporting a bed of filter material above the bottom of the tank, carriage means mounted for movement along the tank in a carriage path, influent means for supplying an influent to the tank above filter bed, a plurality of partitions extending transverse to the carriage path and spaced apart therealong and defining a plurality of fluid receiving compartments below the filter bed support, the tank including a filtered water effluent launder extending along the carriage path, a plurality of filtrate ports spaced apart along a port locus paralleling said carriage path with each filtrate port providing open communication between a respective one of the fluid receiving compartments and the filtered water effluent launder, carriage drive means for driving the carriage means along the carriage path in a backwash run, travelling backwash means including a backwash collector hood mounted on the carriage means for movement therewith in said backwash run sequentially into overlying relation with different sections of the filter bed, the backwash means including waste water pump means connected to the collector hood and operative to pump waste water from the hood, means for operating the backwash means during the backwash run to up-flow backwash different sections of the filter bed in a preselected sequence, cell scavenging means including a fluid intake head, means mounting the fluid intake head on the carriage means for movement into juxtaposition with the filtrate port associated with each filter section

after it has been backwashed by the backwash means, and means for operating the cell scavenging means during the backwash run to draw fluid into the fluid intake head through the filtrate port juxtaposed thereto and down-flow scavenge each filter section subsequent to backwashing of the same.

4,540,488

ION EXCHANGE COLUMNS

Paul A. Connolly, Seascale, and Barry G. Weston, Gosforth, both of England, assignors to British Nuclear Fuels Limited, Warrington, England

Filed Jan. 3, 1984, Ser. No. 567,515

Claims priority, application United Kingdom, Jan. 20, 1983, 8301502

Int. Cl.³ B01J *47/02*

U.S. Cl. 210—268 9 Claims

1. An ion exchange column including an upright chamber to receive ion exchange resin, inlet means at the upper end of the chamber to allow the introduction of resin into the chamber and to provide an inlet for a liquid to be treated, outlet means at the lower end of the chamber, the outlet means comprising a valve member having a rotatable body, at least one bore through the body, the body being rotatable between a first position to support ion exchange resin in the chamber and at the same time to permit drainage of treated liquid from the chamber through the bore and a second position to permit discharge of ion exchange resin from the chamber.

4,540,489

COMPACT WATER PURIFYING DEVICE

Royal W. Barnard, 79 Davis St., Rutland, Vt. 05701

Filed Oct. 18, 1983, Ser. No. 542,998

Int. Cl.³ B01D *27/02*

U.S. Cl. 210—287 2 Claims

1. A filter for removing impurities from water, comprising:

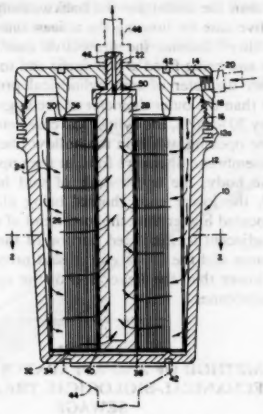
a single sealable container having an inlet port and an outlet port;

a first pre-filter;

a second activated carbon-filter;

a third ceramic microscreen filter; and

means for establishing a uniform water flow pattern and regulated flow rate from said inlet port through said first, second and third filters and thence to said outlet port, with the regulation of the rate of flow being provided by the properties of the ceramic material chosen for the final filter stage.



4,540,490

APPARATUS FOR FILTRATION OF A SUSPENSION

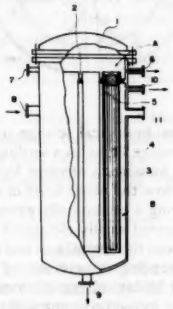
Setsuo Shibata, Handa; Yukihiko Koshiba, Yokohama; Yoshito Hamamoto, Kurashiki; Katsutoshi Kugai, Handa; Akiro Kawashima, Yokohama, and Hiroshi Fujisawa, Fujisawa, all of Japan, assignors to JGC Corporation, Otemachi, Japan

Filed Apr. 12, 1983, Ser. No. 484,156

Claims priority, application Japan, Apr. 23, 1982, 57-67141; Apr. 23, 1982, 57-67142

Int. Cl.³ B01D *29/24*

U.S. Cl. 210—323.2 4 Claims



1. An apparatus for filtering a suspension by means of at least one aggregate of membrane comprising high molecular weight compound-made porous hollow fibers to separate a filtrate from the suspended matter contained in the suspension, backwashing the at least one aggregate of membrane filters with a backwashing gas to clean it and minimizing the amount of suspended matter entrained by the backwashing gas, and repeating the filtration and backwashing alternately, comprising a filtering vessel divided into a feed region and a filtrate region, the filtrate region being above said feed region, an inlet for the suspension at the feed region, and outlet for the filtrate at the filtrate region, an inlet for a backwashing gas in the filtrate region, an outlet for the backwashing gas in the feed region, a partition plate in the filtering vessel to support said aggregate

of membrane filters and to divide the interior of the filtering vessel into said filtrate region and said feed region, an outlet for a portion of said suspension in the feed region at a position lower than the outlet for the backwashing gas, a cylindrical protective case for housing the at least one aggregate of membrane filters therein, the protective case being open at the bottom and being fixed at the upper end to the partition plate, the inner diameter of said cylindrical protective case being greater than the outer diameter of the aggregate of membrane filters by 20 - 100%, the cylindrical case being provided with at least one opening, wherein the hollow fibers of the aggregate of the membrane filters are fixed at the upper end thereof by a tape-like body, the upper ends of said hollow fibers being opened, the lower ends thereof being closed, said opening being located higher than the lower end of said tape-like body, and is adjacent to said fixed portion of the hollow fiber-type membranes and the lower end of said protective case is positioned lower than the lower end of the aggregate of hollow fiber membranes.

4,540,491

METHOD OF AND APPARATUS FOR THE MECHANICAL-BIOLOGICAL TREATMENT OF SEWAGE

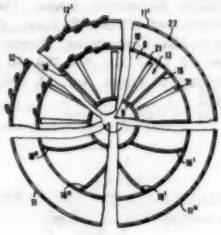
Erich Zimmer, Ikeja, Nigeria, assignor to Water Engineering and Plant Construction GtA reg. Trust, Vaduz, Liechtenstein

Filed Jul. 9, 1984, Ser. No. 628,763

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324853

Int. Cl.³ C02F *3/08*

U.S. Cl. 210—619 **22 Claims**



1. A mechanical-biological sewage treatment plant for the purification of sewage includes a settling tank having a water level therein, an immersion element located within said tank and extending below the water level in said tank, said immersion element having a horizontally extending central axis and including a perforated axially elongated outer tube concentrically arranged about the central axis and said outer tube having opposite ends extending transversely of the central axis, support elements for biological growth located within said outer tube, an inner tube located concentrically about the central axis within and spaced radially inwardly from said outer tube and being almost completely submerged below this water level, said inner tube having opposite ends extending transversely of the central axis, means located within said tank for rotatably supporting said immersion element about the central axis, means for forming a closure extending across the opposite ends of said inner and outer tubes, the outer surface of said outer tube having outwardly extending projections for forming an intensely turbulent sewage air mixture as said immersion element rotates for introducing oxygen into the mixture, said support elements having an outside surface and multiple inside surfaces in spaced relation located inwardly from said outside surface, said support elements being movable relative to one another and to said inner and outer tubes, said inside surfaces having a large surface area and said outside surface having multiple openings therethrough leading to said inside surfaces so that the sewage-air mixture flows through the openings and over the inside surfaces.

20. A method of mechanical-biological treatment of sewage in a settling tank containing a water level, a rotatable immersion element supported in the settling tank and extending below the water level with the immersion element including an outer tube and an inner tube spaced radially inwardly from the outer tube and defining a closed space therebetween, including the steps of forming the outer surface of the outer tube with outwardly extending projections so that the projections extend above the water level during rotation of the immersion element, rotating the immersion element about a horizontal central axis for drawing air into and mixing it with sewage, and rotating the immersion element so that the rotational speed at the circumferential periphery of the outer tube is such that an intensely turbulent and thoroughly mixed sewage-air mixture results, providing support elements movable relative to the inner and outer tubes and on which biological growth collects in the space between the inner and outer tube, and flowing the sewage-air mixture through the interior of support elements in contact with the biological growth for effecting the treatment of the sewage.

4,540,492

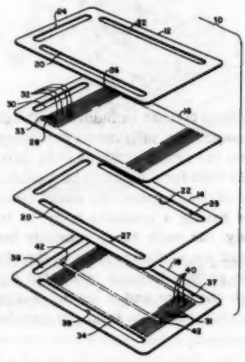
METHOD AND APPARATUS FOR TREATING WHOLE BLOOD

Stephen B. Kessler, Gloucester, Mass., assignor to Millipore Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 321,822, Nov. 16, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,380

Int. Cl.³ B01D *31/00, 13/00*

U.S. Cl. 210—651 **13 Claims**



1. Apparatus for treating whole blood to effect material transfer from or into the whole blood which comprises:

at least two contiguous membrane units, each unit consisting of a first membrane layer, a second membrane layer, a first spacer layer positioned on a first surface of the first membrane layer and a second spacer layer positioned between a second surface of said first membrane layer and a first surface of said second layer,

each of said membrane layers and said spacer layers being securely bonded over their entire mating surfaces,

said first spacer layer having a plurality of channels extending through the thickness of said first spacer layer, said channels having a width and length to permit continuous removal of whole blood from a patient for passage through said channels and continuous reintroduction of plasma depleted blood to the patient, each of said channels being between about 0.02 and 0.2 mm in height, inlet means for introducing whole blood into said channels and blood outlet means for removing treated blood from said channels,

said second spacer including means for introducing material into said whole blood or for removing material from said whole blood through said membrane layers,

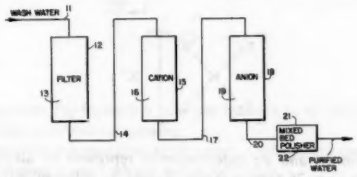
sealing means associated with each of said first and second spacers for preventing whole blood from being admixed with material introduced into said whole blood without first passing said material through a membrane layer or for preventing whole blood from being admixed with blood from which a blood fraction has been removed.

4,540,493

PROCESS FOR TREATING WASH WATER FROM THE MANUFACTURE OF TEREPHTHALIC ACID

Richard C. Dickerson, and William S. Miller, both of Virginia Beach, Va., assignors to Ecolochem, Inc., Norfolk, Va.

Filed Nov. 30, 1983, Ser. No. 556,338
Int. Cl.³ C02F *1/42*
U.S. Cl. 210—669 **22 Claims**



1. A process for treating wash water from the manufacture of terephthalic acid, said wash water comprising dissolved terephthalic acid, metal catalyst, and dissolved organic acid byproducts, comprising the first step of passing said water through a cation exchange resin to remove said metal catalyst and the second step of passing said water through an anion exchange resin to remove said terephthalic acid and said byproducts.

4,540,494

METHOD FOR THE REMOVAL OF OXYGEN DISSOLVED IN WATER

Wilfried Fuchs, Halle-Neustadt; Horst Richter, Bad Dürrenberg; Vendelin Kaufmann, Leuna; Wolfgang Renker, Leuna, and Roland Kober, Leuna, all of German Democratic Rep., assignors to VEB Leuna Werke "Walter Ulbricht", Leuna, German Democratic Rep.

Filed Mar. 10, 1983, Ser. No. 473,933
Int. Cl.³ C02F *1/70*
U.S. Cl. 210—750 **3 Claims**

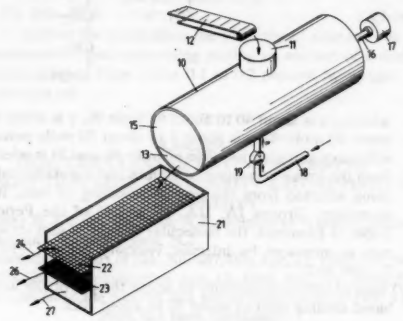
1. A process for the removal of oxygen dissolved in water by improving the activity of hydrazine as an oxygen removal agent which comprises adding an effective amount of hydrazine and a trivalent cobalt complex selected from the group consisting of sodium hexanitritocobalt (III), cobalt (III) hexaminochloride, chloropentamine cobalt (III) chloride, carbonatopentamino cobalt (III) nitrate, and mixtures thereof, to oxygen-containing water, about 0.01 to 0.3% by weight of cobalt complex being added to an aqueous solution comprising about 10 to 25% by volume of hydrazine, said cobalt complex and hydrazine being added to said oxygen-containing water at a pH of about 8 to 11.

4,540,495

PROCESS FOR TREATING MUNICIPAL SOLID WASTE

Clifford C. Holloway, Birmingham, Ala., assignor to Lewis B. Holloway and Winford B. Holloway, both of Birmingham, Ala., part interest to each

Filed May 15, 1984, Ser. No. 610,428
Int. Cl.³ C02F *11/18*
U.S. Cl. 210—774 **10 Claims**



1. The process for treating municipal solid waste material in the presence of moisture for the separation and recovery of inorganic matter and organic matter comprising fermentable vegetable material, comprising the following steps:

(a) feeding said waste material into a pressure chamber,

(b) agitating said waste material while in said pressure chamber in the presence of moisture,

(c) subjecting said waste material in said pressure chamber to heat under a pressure ranging from approximately 40 psig to 75 psi for a period ranging from approximately 30 minutes to 90 minutes to cook and sterilize said waste material and soften said organic matter contained therein,

(d) controlling the moisture content of said waste material cooked in said pressure chamber so that the fines of said organic fraction thereof have a residual moisture content ranging from approximately 60% to 70%,

(e) releasing the pressure from said chamber,

(f) discharging the cooked waste material from said chamber, and

(g) separating and classifying said cooked waste material into various fractions thereof, including an inorganic fraction and the fines of said organic fraction having a residual moisture content ranging from approximately 60% to 70%.

4,540,496

INTRAMOLECULAR POLYMER COMPLEXES - VISCOSIFIERS FOR HIGH IONIC STRENGTH DRILLING FLUIDS

Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater, both of N.J.; Thad O. Walker, Humble, Tex., and S. Richard Turner, Rochester, N.Y., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Mar. 25, 1983, Ser. No. 478,683
Int. Cl.³ C09K *7/02*
U.S. Cl. 252—8.5 A **5 Claims**

1. A drilling mud which comprises:

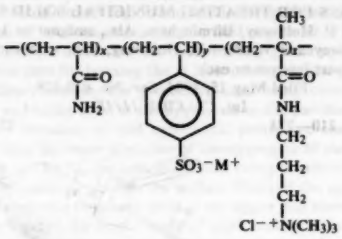
(a) salt water having about 0.1 to about 50 grams of salt per 100 ml. of water;

(b) about 4 to about 30 lbs/bbl of clay;

(c) about 1 to about 30 lbs/bbl of a lignosulfonate;

(d) weighting material of sufficient quantity necessary to achieve the desired density;

(e) about 0.25 to about 5 lbs/bbl of a terpolymer having the formula:



wherein x is about 40 to about 98 mole %, y is about 1 to about 50 mole %, z is about 1 to about 50 mole percent, wherein y and z are less than 60 mole %, and M is selected from the group consisting of amines and a metallic cation being selected from the group consisting of lead, iron, aluminum, Groups IA, IIA, IB and II of the Periodic Table of Elements, the molecular weight of said terpolymer as measured by intrinsic viscosity being 1×10^3 to 5×10^6; and

(f) base of sufficient quantity to adjust the pH of the water-based drilling mud to about 10 to about 10.5.

4,540,497

FLUOROALIPHATIC RADICAL-CONTAINING, SUBSTITUTED GUANIDINES AND FIBROUS SUBSTRATES TREATED THEREWITH

John C. Chang, and Richard D. Howells, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 9, 1982, Ser. No. 440,330
Int. Cl.³ D06M *15/00*
U.S. Cl. 252—8.8 **17 Claims**

1. Normally solid, water-insoluble, fluorochemical guanidine compositions which are fluoroaliphatic radical-containing, substituted guanidine compounds, or compositions comprising mixtures thereof, said compounds having one or more monovalent fluoroaliphatic radicals having at least three fully fluorinated carbon atoms and one or more substituted guanidino moieties of the formula

said radicals and moieties being bonded together by linking groups selected from aliphatic, aromatic, oxy, thio, carbonyl, sulfone, sulfoxy, —N(CH_3)—, sulfonamido, carbonamido, sulonamidoalkylene, carbonamidolkylene, carbonyloxy, urethane, urea, and combinations thereof, with the proviso that when only one guanidino moiety is present, and only two organic substituents are in said guanidino moiety, said substituents must be on different nitrogen atoms of the moiety, and when more than one guanidine moiety is present, said moieties are bonded together by divalent linking groups selected from the group consisting of alkylene, aralkylene, arylene, polyoxyalkylene, and combinations thereof and can contain said fluoroaliphatic radical.

4,540,498

BLOCK COPOLYMERS FOR ENHANCED OIL RECOVERY

Muyen M. Wu, and Lawrence E. Ball, both of Cuyahoga Falls, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 31, 1983, Ser. No. 499,717
Int. Cl.³ E21B *42/20, 42/22*
U.S. Cl. 252—8.55 D **10 Claims**

1. In a process of recovering hydrocarbon from a hydrocarbon-bearing subterranean formation having at least one injection means in fluid communication with at least one production means and wherein polymer solution is injected into the formation to displace hydrocarbon toward the production means through which hydrocarbon is recovered, the improvement comprising injecting a polymer solution comprising a water soluble block copolymer, said copolymer comprising two or more water soluble polymer blocks.

4,540,499

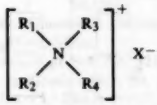
FABRIC TREATING COMPOSITION FOR ADDITION TO GRANULAR DETERGENT

Takenobu Sakatani, Chiba, and Shigeru Suzuki, Ichikawa, both of Japan, assignors to Lion Corporation, Sumida, Japan

Filed Jun. 30, 1983, Ser. No. 509,726
Claims priority, application Japan, Jul. 5, 1982, 57-116581
Int. Cl.³ D06M *13/46*
U.S. Cl. 252—8.75 **4 Claims**

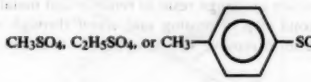
1. An additive composition for a granular detergent comprising:

(a) A quaternary ammonium salt having the general formula (I):



(I)

wherein R_1 and R_2 independently represent an alkyl group having 12 to 26 carbon atoms, R_3 and R_4 independently represent an alkyl group having 1 to 4 carbon atoms, a benzyl group, a hydroxyalkyl group having 2 to 4 carbon atoms, or a polyoxyalkylene group having 1 to 5 mole oxyalkylene units, and X represents a halogen atom,



and

(b) a nonionic cellulose derivative, the ratio of component (a)/component (b) in a weight basis of 99.9/0.1 to 50/50, said additive composition being granulated from a mixture of the molten quaternary ammonium salt having the general formula (I) and the nonionic cellulose derivative by (i) spraying the mixture, followed by cooling or (ii) solidifying the mixture upon cooling, followed by crushing.

4,540,500

LOW TEMPERATURE SINTERABLE OXIDE MAGNETIC MATERIAL

Michihiro Torii; Tomoyoshi Kosaka, both of Shizuoka; Takeo Maeda, Aichi, and Hiroshi Rikukawa, Shizuoka, all of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP83/00055, § 371 Date Oct. 20, 1983, § 102(e) Date Oct. 23, 1983, PCT Pub. No. WO83/03094, PCT Pub. Date Sep. 15, 1983
PCT Filed Feb. 23, 1983, Ser. No. 557,136
Claims priority, application Japan, Mar. 2, 1982, 57-32646
Int. Cl.³ C04B *35/26, 35/64*
U.S. Cl. 252—62.58 **5 Claims**

1. A method for reducing the sintering temperature of a magnetic ferrite material containing at least 0.5 mol % of Li_2O which consists essentially of adding 0.1 to 5% by weight of a

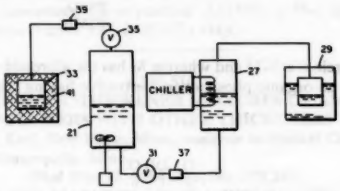
glass consisting essentially of 3 to 50 mol % of Li_2O, 10 to 97 mol % of B_2O_3 and 0 to 70 mol % of SiO_2 to said magnetic ferrite material prior to sintering, said glass effecting a magnetic ferrite material having a lower sintering temperature than said magnetic ferrite material absent said glass.

4,540,501

GAS HYDRATE COOL STORAGE SYSTEM

Mark P. Ternes, Knoxville, and Robert J. Kedl, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 12, 1984, Ser. No. 649,628
Int. Cl.³ C09K *3/18*; F25B *15/00*
U.S. Cl. 252—70 **9 Claims**



1. A process for formation of a gas hydrate to be used as a cool storage medium comprising:

partially filling a container with water, a refrigerant capable of forming a gas hydrate and a surfactant;

agitating said water, refrigerant and surfactant at a rate sufficient to effect mixing thereof;

lowering the pressure within said container by vapor removal until the temperature and pressure for formation of gas hydrate is reached.

4,540,502

HEAT STORAGE MATERIAL

Hiroshi Kimura, Sakai, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,640
Claims priority, application Japan, Dec. 15, 1982, 57-222272; Dec. 15, 1982, 57-222273; Jun. 21, 1983, 58-113065
Int. Cl.³ C09K *5/06*
U.S. Cl. 252—70 **12 Claims**

1. A heat storage material which comprises $CaCl_2.6H_2O$, as a main component, an amount effective to decrease the melting point thereof of at least one anhydrous component selected from the group consisting of NH_4Br and KNO_3 and mixtures thereof with at least one of KBr and NH_4NO_3, and up to an amount not exceeding the saturation point of the anhydrous NH_4Br or KNO_3 in the liquefied heat storage material at 30° C. and not exceeding a concentration of 10 percent by weight, and 0 to 10% of at least one hydrate selected from the group consisting of a hydrate of a chloride other than of calcium, a bromide and a nitrate.

5. A heat storage material which comprises $CaCl_2.6H_2O$, as a main component, containing (a) an anhydrous bromide, (b) an anhydrous nitrate and (c) at least one hydrate selected from the group consisting of a hydrate of a chloride of other than calcium, a bromide and a nitrate, the total of (a) and (b) being an amount effective to decrease the melting point of $CaCl_2.6H_2O$ and up to an amount not exceeding the saturation point of the same in the liquefied heat storage material at 30° C. and not exceeding a concentration of up to 10% by weight, and the amount (c) being effective to diminish supercooling but not more than 10% by weight of the composition.

4,540,503

METHOD FOR CONTROLLING THE VISCOSITY OF SILOXANE OILS

A. Andrew Carey, Lenoir City, and Joel T. Shor, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 12, 1984, Ser. No. 649,623
Int. Cl.³ C09K *5/00*
U.S. Cl. 252—78.3 **3 Claims**

1. A method for controlling the viscosity of siloxane oils in the presence of lead comprising adding an amount of a dione corresponding to from about 0.1 to 0.2 percent by weight of the siloxane oil.

4,540,504

DENTURE CLEANER HAVING IMPROVED DISSOLUTION TIME AND CLARITY AND METHOD OF PREPARATION

Anthony B. J. Eoga, Boonton, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 487,489, Apr. 22, 1983, Pat. No. 4,518,520. This application Apr. 13, 1984, Ser. No. 599,831
The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.
Int. Cl.³ C11D *7/18, 7/30, 7/56, 17/00*
U.S. Cl. 252—99 **19 Claims**

1. An improved effervescent cleansing composition in tablet form comprising:

(a) about 20% to about 45% by weight of the final composition of an alkali metal or alkaline earth metal phosphate salt;

(b) an improved perborate salt mixture wherein the improvement comprises a combination of anhydrous perborate and monohydrate perborate in the amount of about 50% to about 70% by weight of the total cleansing composition, wherein the combination includes at least 20% by weight of the total cleansing composition of anhydrous perborate, wherein the proportion of anhydrous to monohydrate perborate is from about 1 to 3 to about 3 to 1, said combination having a portion present in a compacted, granulated mixture with from about 0.01% to about 0.70% by weight of said combination of a polymeric fluorocarbon, said cleansing composition being capable of thoroughly cleansing stained surfaces within a soaking time of five minutes or less when dissolved in aqueous solution;

(c) a sequestering agent in amounts of greater than about 10% by weight up to about 50% by weight of the composition, said sequestering agent being selected from the group consisting of phosphonic acid derivatives, carboxylic acid derivatives and mixtures thereof.

4,540,505

DISINFECTANT SPRAY CLEANSER CONTAINING GLYCOL ETHERS

Charles Frazier, Kinnelon, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 266,265, May 22, 1981, abandoned, which is a continuation of Ser. No. 89,330, Oct. 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 62,079, Jul. 30, 1979, abandoned. This application Aug. 27, 1981, Ser. No. 296,759
Int. Cl.³ C11D *1/62, 3/44, 7/50*
U.S. Cl. 252—106 **5 Claims**

1. A clear, stable aqueous cleanser composition comprising about 0.45 to 0.7 percent of a germicidally effective quaternary ammonium compound; about 0.4 to 1 percent d-limonene; about 1 to 1.5 percent of a non-ionic surfactant selected from an ethoxylated linear (C_{12}–C_{15}) alcohol and an ethoxylated alkyl phenol, containing about 7 to 12 moles of condensed ethylene oxide; about 1 percent of an alkali builder and about

4 to 6 percent of a monoether of an aliphatic glycol containing about 59 to 65 percent, by weight, carbon.

4,540,506

COMPOSITION FOR CLEANING DRAINS CLOGGED WITH DEPOSITS CONTAINING HAIR

James W. Jacobson, Rockville; J. Leslie Glick, Potomac, and Kenneth L. Madello, Jefferson, all of Md., assignors to Genex Corporation, Rockville, Md.

Filed Apr. 15, 1983, Ser. No. 485,473

Int. Cl.³ C11D 7/42

U.S. Cl. 252—174.12 **37 Claims**

1. A composition for cleaning drains clogged with a hair-containing deposit which comprises: a hair-disintegrating amount of a mixture of a proteolytic enzyme, a disulfide reducing agent, and at least one member selected from the group consisting of a thickening agent, detergent, or stabilizer, said composition having a pH that enhances hair denaturation.

4,540,507

CLEANING PRODUCT FOR THE HAIR AND SKIN, BASED ON ACYLISETHIONATES, CATIONIC POLYMERS AND SALTS OF FATTY ACID/POLYPEPTIDE CONDENSATES

Jean F. Grollier, Paris, France, assignor to L'Oreal, Paris, France

Filed Jan. 27, 1983, Ser. No. 461,525

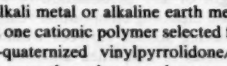
Claims priority, application Luxembourg, Jan. 29, 1982, 83911

Int. Cl.³ A61K 7/06; C11D 7/34

U.S. Cl. 252—174.23 **16 Claims**

1. A cleaning composition for the hair and skin consisting essentially of, in combination, in a cosmetically acceptable medium,

(a) at least one surface-active agent of the formula:



(I)

wherein R denotes a linear or branched alkyl group and M denotes an alkali metal or alkaline earth metal or an amine,

(b) at least one cationic polymer selected from a quaternized or non-quaternized vinylpyrrolidone/dialkylaminoalkyl acrylate or methacrylate copolymer, and

(c) at least one salt of a fatty acid/polypeptide condensate.

4,540,508

ALKYLENE PHOSPHONIC ACID SCALE INHIBITOR COMPOSITIONS

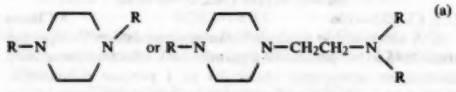
David A. Wilson, Richwood, and Druce K. Crump, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 8, 1982, Ser. No. 439,964

Int. Cl.³ C02F 5/10

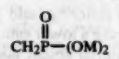
U.S. Cl. 252—180 **11 Claims**

1. An improved organic phosphonic acid threshold agent for inhibiting scale formation by alkaline earth metal salts which comprises a piperazine phosphonic acid derivative having the formula

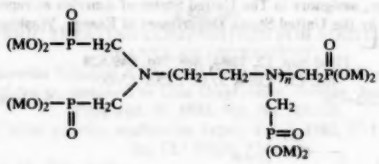


(a)

wherein R is hydrogen, hydroxyethyl, hydroxypropyl, methylenesulfonate, hydroxyethylsulfonate, hydroxypropylsulfonate, carboxymethyl or

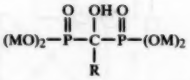


and wherein M is hydrogen, an alkali metal, an ammonium or a di- or triethanolamine radical in combination with a phosphonic acid derivative of an amine having the formula

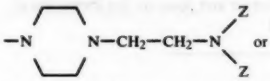


(b)

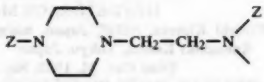
wherein n is 0–14 and wherein M has the aforesaid meaning; or an organic phosphonate derivative having the formula



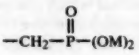
wherein R is an alkyl radical having 1–3 carbon atoms and M has the aforesaid meaning; or a polymer having the formula $A(BA)_m$ wherein A is an organic radical having the formula



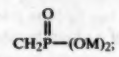
or



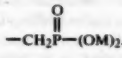
wherein Z is hydrogen, hydroxyethyl, hydroxypropyl,



or BA and M is a H, Na or NH_4 radical and wherein at least 50% of the Z groups are



B is a moiety derived from ethylene dichloride or epichlorohydrin and m is 1 or 2, with the proviso that at least 50% of the R groups of the (a) component are



wherein the (a) component comprises from about 50 to 95% of the combination threshold agent.

4,540,509

CRYSTALLINE 3-LAYER LITHIUM ALUMINATES

John L. Burba, III, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 217,614, Dec. 18, 1980, Pat. No. 4,348,295. This application Aug. 30, 1982, Ser. No. 412,612
The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.
Int. Cl.[3] C01D *15/04*; B01D *15/04*; C09K *3/00*
U.S. Cl. 252—184 12 Claims

1. A process for preparing crystalline 3-layer $LiX.2Al(OH)_3.nH_2O$ in a macroporous ion exchange resin, said process comprising

reacting a composite of a macroporous ion exchange resin, which is in its base form and which contains crystalline $Al(OH)_3$ dispersed therein,

by mixing the said composite with hot, concentrated aqueous solution of LiX, where X is an anion,

thereby converting the crystalline $Al(OH)_3$ in the resin to crystalline 3-layer $LiX.2Al(OH)_3.nH_2O$.

4,540,510

SYNERGISTIC THICKENER MIXTURES OF AMPS POLYMERS WITH OTHER THICKENERS

Curtis L. Karl, New Hope, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Feb. 13, 1984, Ser. No. 579,242
Int. Cl.[3] C08B *37/00*; C08F *128/02*; C09K *7/00*; G05D *24/00*
U.S. Cl. 252—315.3 11 Claims

1. A composition comprising a mixture of a polymer of an acrylamido methylpropanesulfonic acid having a molecular weight of above about one million and a water soluble polymer selected from the group consisting of galactomannan gums, hydroxyalkyl ethers of galactomannan gums, hydroxyalkyl cellulose ethers, polyalkylene oxide polymers and mixtures thereof, wherein the alkyl and alkylene groups contain from 2 to 8 carbon atoms, said polymers in said mixture being in a ratio to synergistically thicken liquids.

7. A thickened liquid composition comprising a liquid selected from the group consisting of water, an alcohol and mixtures thereof and a thickener, said thickener comprising a mixture of a polymer of an acrylamido methylpropanesulfonic acid and a water soluble polymer selected from the group consisting of galactomannan gums, hydroxyalkyl ethers of galactomannan gums, hydroxyalkyl cellulose ethers, polyalkylene oxide polymers and mixtures thereof, wherein the alkyl and alkylene groups contain from 2 to 8 carbon atoms, said polymers in said mixture being in a ratio to synergistically thicken said liquids.

4,540,511

DEFOAMER AND PROCESSING AID FOR WET PROCESS PHOSPHORIC ACID

Eugene F. McCaffrey; Alfred J. Dieterman, both of Mississauga, and Luba Knazko, Palgrave, all of Canada, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 15, 1984, Ser. No. 580,395
Int. Cl.[3] B01D *19/04*
U.S. Cl. 252—321 13 Claims

8. A method of inhibiting foaming in a phosphate rock and sulfuric acid medium employed in the synthesis of phosphoric acid which comprises adding to the reaction medium an effective amount of a defoamer composition comprising a mixture of:

(a) 50 to 95 weight percent of a monocarboxylic acid from 12 to 26 carbon atoms and a melting point below about 20° C.;

(b) 5 to 45 weight percent of a monoalkanolamide, wherein said monoalkanolamide is derived from a monocarboxylic acid having from 12 to 26 carbon atoms and a melting point below about 20° C. and a monoalkanolamine; and

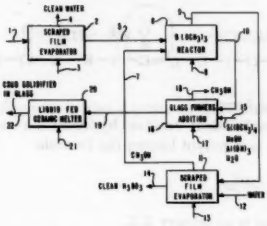
(c) 0.25 to 20 weight percent of an alcohol selected from the group consisting of primary linear aliphatic alcohols ranging from C_4 to C_{20}, primary branched aliphatic alcohols ranging from C_4 to C_{20}, and secondary alcohols ranging from C_6 to C_{12}.

4,540,512

RECOVERY OF BORIC ACID FROM NUCLEAR WASTE

Edward J. Lahoda, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 6, 1983, Ser. No. 482,737
Int. Cl.[3] G21F *9/08, 9/16*
U.S. Cl. 252—629 7 Claims



1. A process for separating and recovering boric acid from water containing solids which include boric acid and radionuclides comprising:

(A) separating said water from said solids by evaporating said water at a temperature under about 130° F.;

(B) adding methanol to said solids in at least the amount stoichiometrically required to

(1) react with said boric acid to form boron methoxide and water, and

(2) form a boron methoxide-methanol azeotrope;

(C) separating said boron methoxide by evaporating said boron methoxide-methanol azeotrope by heating it at its boiling point, 54° C.;

(D) adding water to said boron methoxide to form boric acid and methanol; and

(E) separating said methanol from said boric acid by evaporating said methanol.

4,540,513

DECAPEPTIDE HAVING GONADOTROPIN RELEASING ACTIVITY

Kaoru Miyamoto, Shintou Arai, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 25, 1984, Ser. No. 654,289
Int. Cl.[3] C07C *103/52*
U.S. Cl. 260—112.5 R 1 Claim

1. A decapeptide having the formula:

pGlu-His-Trp-Ser-His-Gly-Trp-Tyr-Pro-Gly-NH_2.

4,540,514

5-CYANO- AND 5-CARBAMOYL-10-NITRO-5H-DIBENZ[b,f]AZEPINE

Ernst Aufderhaar, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 498,226, May 26, 1983, Pat. No. 4,452,738, which is a division of Ser. No. 198,886, Oct. 20, 1980, abandoned. This application Feb. 27, 1984, Ser. No. 584,056
Claims priority, application Switzerland, Oct. 30, 1979, 9703/79
Int. Cl.[3] C07D *41/08*
U.S. Cl. 260—239 D 2 Claims

1. 5-Cyano-10-nitro-5H-dibenz[b,f]azepine.

2. 5-Carbamoyl-10-nitro-5H-dibenz[b,f]azepine.

4,540,515

N-SUBSTITUTED CARBAMOYL-LACTAM COMPOUND

Albert A. van Geenen, Brunssum; Joseph J. M. Bongers, Elsloo; Jozef L. M. van der Loos, Sittard, and Cornelis H. Vrinssen, Geleen, all of Netherlands, assignors to Stamicarbon B.V., Licensing Subsidiary of DSM, Geleen, Netherlands

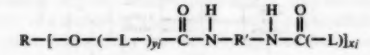
Filed Aug. 17, 1984, Ser. No. 641,773

Claims priority, application Netherlands, Aug. 20, 1983, 8302928

Int. Cl.³ C07D *223/10*

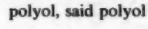
U.S. Cl. 260—239.3 R **8 Claims**

1. An N-substituted carbamoyl-lactam compound having the formula:



wherein said formula

R is a multivalent residue hydrocarbon radical from a polyol, said polyol having the formula



where xi is an integer ≧2,

R′ is a divalent hydrocarbon residue radical,

yi is an integer >0,

—(—L) is an unopened lactam ring, and

—(—L—) is an opened lactam block.

4,540,516

PROCESS FOR THE PREPARATION OF AN N-SUBSTITUTED CARBAMOYL-LACTAM COMPOUND

Albert A. van Geenen, Brunssum; Joseph J. M. Bongers, Elsloo, and Jozef L. M. van der Loos, Sittard, all of Netherlands, assignors to Stamicarbon B.V., Licensing Subsidiary of DSM, Geleen, Netherlands

Filed Aug. 17, 1984, Ser. No. 641,772

Claims priority, application Netherlands, Aug. 20, 1983, 8302929

Int. Cl.³ C07D *223/10*

U.S. Cl. 260—239.3 R **15 Claims**

1. A process for preparing a N-substituted carbamoyl-lactam compound by reacting a polyol having an equivalent weight of at least 300 and ranging up to about 2500, with a lactam-blocked polyisocyanate in the liquid state in the presence of a metal compound catalyst.

4,540,517

ANTIBIOTIC TAN-420

Seiichi Tanida, Nagaokakyo; Masayuki Muroi, Suita, and Toru Hasegawa, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

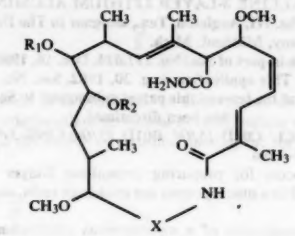
Filed Dec. 2, 1983, Ser. No. 557,364

Claims priority, application Japan, Dec. 3, 1982, 57-212974

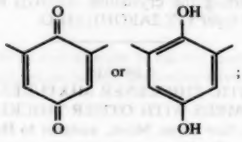
Int. Cl.³ C07D *225/06*; C12P *13/00*; C12R *1/365*

U.S. Cl. 260—239.3 B **6 Claims**

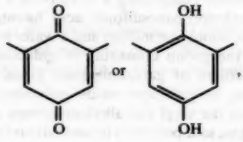
1. A compound of the formula:



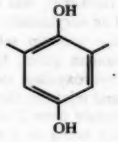
wherein R_1 and R_2 are the same or different and each represents hydrogen or methyl and X is



provided that when R_1 is hydrogen, R_2 is hydrogen or methyl and X is



and when R_1 is methyl, R_2 is methyl and X is



4,540,518

ZINC AND ALUMINUM PHTHALOCYANINES

Claude Eckhardt, Riedisheim, France, and Gerd Hölzle, Liestal, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

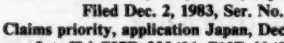
Division of Ser. No. 236,423, Feb. 20, 1981, Pat. No. 4,368,053. This application Sep. 30, 1982, Ser. No. 431,457

Claims priority, application Switzerland, Feb. 29, 1980, 1624/80

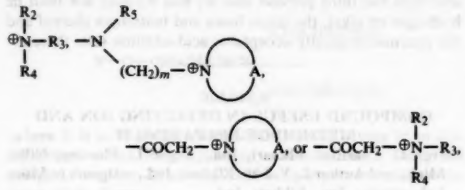
Int. Cl.³ C09B *47/32*

U.S. Cl. 260—242.2 **9 Claims**

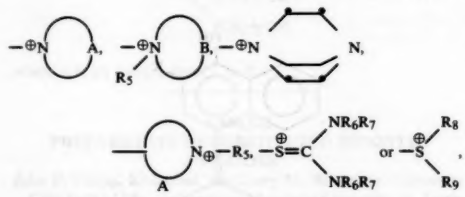
1. A phthalocyanine of the formula



wherein PC is the unsubstituted zinc or aluminum phthalocyanine ring system, v is any number from 1 to 4, R_1 is unbranched or branched alkylene of 1 to 8 carbon atoms or 1,3- or 1,4-phenylene, X_1 is NH or N-alkyl, $X^{\oplus}$ is a group of the formula

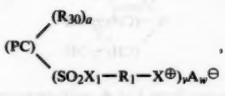


and, if R_1 is alkylene, is also a group of the formula

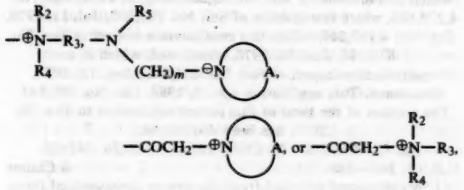


in which formulae each of R_2 and R_3 independently is C_1–C_6 alkyl, unsubstituted or substituted by halogen, hydroxyl, cyano, phenyl, carboxyl, carbalkoxy or alkoxy, R_4 is C_1–C_6 alkyl, unsubstituted or substituted by halogen, hydroxyl, cyano, phenyl, carboxyl, carbalkoxy or alkoxy, C_3–C_7 cycloakyl or the NR_6R_7 group, R_5 is alkyl, R_6 and R_7 independently is hydrogen or alkyl, unsubstituted or substituted by halogen, hydroxyl cyano, phenyl, carboxyl, carbalkoxy or alkoxy, each of R_8 and R_9 independently is an alkyl, unsubstituted or substituted by halogen, hydroxyl, cyano, phenyl, carboxyl, carbalkoxy, or alkoxy or aralkyl radical, unsubstituted or substituted by alkyl, alkoxy, halogen, carboxyl, carbalkoxy, hydroxyl, amino, cyano, sulfo or sulfonamido, m is an integer from 1 to 6, A completes an aromatic 5- to 7-membered nitrogen-containing heterocyclic ring system which may contain one or two additional nitrogen atoms as ring members and which is unsubstituted or substituted by alkyl, alkoxy, halogen, carboxyl, carbalkoxy, hydroxyl, amion, cyano, sulfo or sulfonamido, and B completes a saturated 5- to 7-membered nitrogen-containing heterocyclic ring system which may additionally contain 1 or 2 nitrogen, oxygen and/or sulfur atoms as ring members and which is unsubstituted or substituted by C_1–C_4 alkyl at one carbon atom or at a further nitrogen atom in the ring, and $A^{\ominus}$ is an inorganic or organic anion, w has the same value as v with respect to monovalent anions $A^{\ominus}$ and is $\leqq$v with respect to polyvalent anions, and $A_w^{\ominus}$ must balance the positive charge, with the proviso that, if v is $\neq 1$, the radicals SO_2X_1—R_1—$X^{\oplus}$ are the same or different, and that the phthalocyanine ring system can contain additional water-solubilizing groups, and that all substitutents are attached to the phenyl nuclei of the phthalocyanine ring system.

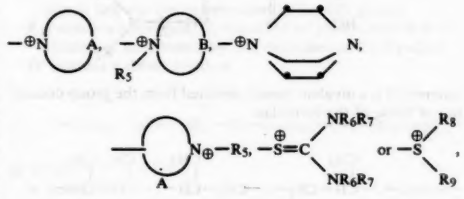
4. A phthalocyanine compound of of the formula



wherein PC is the unsubstituted zinc or aluminum phthalocyanine ring system, v is any number from 1 to 4, R_1 is unbranched or branched alkylene of 1 to 8 carbon atoms or 1,3- or 1,4-phenylene, X_1 is NH of N-alkyl, X^+ is a group of the formula



and, if R_1 is alkylene, is also a group of the formula



in which formulae each of R_2 and R_3 independently is C_1–C_6 alkyl, unsubstituted or substituted by halogen, hydroxyl, cyano, phenyl, carboxyl, carbalkoxy or alkoxy, R_4 is C_1–C_6 alkyl, unsubstituted or substituted by halogen, hydroxyl, cyano, phenyl, carboxyl, carbalkoxy or alkoxy, C_3–C_7 cycloalkyl or the NR_6R_7 group, R_5 is alkyl, each of R_6 and R_7 independently is hydrogen or alkyl, unsubstituted or substituted by halogen, hydroxyl, cyano, phenyl, carboxyl, carbalkoxy or alkoxy, each of R_8 and R_9 independently is an alkyl, unsubstituted or substituted by halogen, hydroxyl, cyano, phenyl, carboxyl, carbalkoxy, or alkoxy or aralkyl radical, unsubstituted or substituted by alkyl, alkoxy, halogen, carboxyl, carbalkoxy, hydroxyl, amino, cyano, sulfo or sulfonamido, m is an integer from 1 to 6, A completes an aromatic 5- to 7-membered nitrogen-containing heterocyclic ring system which may contain one or two additional nitrogen atoms as ring members and which is unsubstituted or substituted by alkyl, alkoxy, halogen, carboxyl, carbalkoxy, hydroxyl, amino, cyano, sulfo or sulfonamido, and B completes a saturated 5- to 7-membered nitrogen-containing heterocyclic ring system which may additionally contain 1 or 2 nitrogen, oxygen and/or sulfur atoms as ring members and which is unsubstituted or substituted by C_1–C_4 alkyl at one carbon atom or at a further nitrogen atom in the ring, and A^- is an inorganic or organic anion, w has the same value as v with respect to monovalent anions A^- and is $<$v with respect to polyvalent anions, and A_w^- must balance the positive charge, with the proviso that, if v is $\neq 1$, the radicals SO_2X_1—R_1—X^+ are the same or different, and that the phthalocyanine ring system can contain additional water-solubilizing groups, and that all substituents are attached to the phenyl nuclei of the phthalocyanine ring system, R_{30} is halogen, cyano, alkyl, alkoxy, or phenyl and a is any number from 0.1 to 4, with the radicals R_{30} present in the molecule being the same or different.

4,540,519

1,4-BIS(SUBSTITUTED-AMINO)-5,8-DIHYDROXYANTHRAQUINONES AND LEUCO BASES THEREOF

Keith C. Murdock, Pearl River, N.Y., and Frederick E. Durr, Ridgewood, N.J., assignors to American Cyanamid Company, Stamford, Conn.

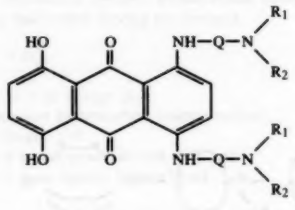
Division of Ser. No. 239,939, Mar. 2, 1981, Pat. No. 4,456,552, which is a division of Ser. No. 63,285, Aug. 2, 1979, Pat. No. 4,278,689, which is a division of Ser. No. 923,602, Jul. 11, 1978, Pat. No. 4,197,249, which is a continuation-in-part of Ser. No. 873,040, Jan. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 824,872, Aug. 15, 1977, abandoned. This application Apr. 9, 1984, Ser. No. 598,141

The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

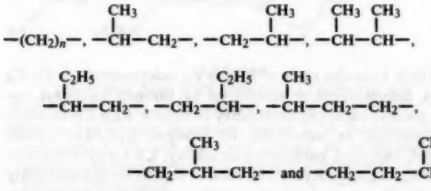
Int. Cl.[3] **C07C** *97/26;* **C07D** *265/30, 203/26, 241/02*

U.S. Cl. 260—380 **4 Claims**

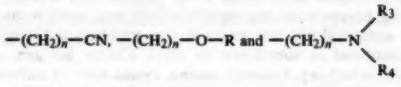
1. A compound selected from the group consisting of those of the formula:



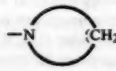
wherein Q is a divalent moiety selected from the group consisting of those of the formulae:



wherein n is an interger from 2 to 4, inclusive; R_1 and R_2 are each individually selected from the group consisting of hydrogen, alkyl having form 1 to 4 carbon atoms, monohydroxyalkyl having from 2 to 4 carbon atoms and wherein the carbon atom alpha to the nitrogen atom may not bear an hydroxy group and moieties of the formulae:



wherein n is an integer from 2 to 4, inclusive, R is alkyl having from 1 to 4 carbon atoms, and R_3 and R_4 taken together with their associated N(itrogen) are morpholino, thiomorpholino, piperazino, 4-methyl-1-piperazino or a moiety of the formula:



wherein m is an integer from 2 to 6, inclusive; with the first proviso that the ratio of the total number of carbon atoms to the sum of the total number of oxygen atoms plus the total number of nitrogen atoms in the side-chains at the 1-position and the 4-position may not exceed four and with the second proviso that when either of R_1 or R_2 is monohydroxyalkyl then the other may not be hydrogen, alkyl or monohydroxyalkyl and with the third proviso that R_1 and R_2 may not both be hydrogen or alkyl; the leuco bases and tautomers thereof and the pharmacologically acceptable acid-addition salts thereof.

4,540,520

COMPOUND USEFUL IN DETECTING ION AND METHOD OF PREPARING IT

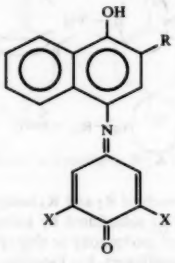
Steven C. Charlton, Elkhart, Ind.; Roger L. Fleming, Niles, Mich., and Authur L. Y. Lau, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 12, 1983, Ser. No. 493,981

Int. Cl.[3] **C07C** *97/18*

U.S. Cl. 260—396 N **6 Claims**

1. A compound having the structure



in which R is lower alkyl and X is halogen or pseudohalogen.

4,540,521

LIQUID QUATERNARY AMMONIUM ANTISTATIC COMPOSITIONS

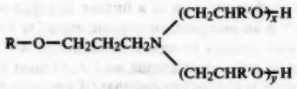
Roger H. Garst, Greer; Frank N. Tuller, Simpsonville, and Charles R. Tucker, Spartanburg, all of S.C., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,038

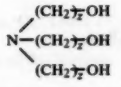
Int. Cl.[3] **C07C** *93/04*

U.S. Cl. 260—459 A **11 Claims**

1. An improved liquid quaternary ammonium antistatic composition obtained by quaternizing a mixture of amines consisting of 80 to 99.5 weight percent (a) alkoxylated ether amine of the formula



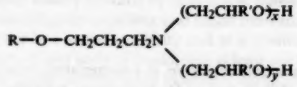
where R is an aliphatic hydrocarbon radical having from 2 to 20 carbon atoms, R' is hydrogen or methyl and x and y are integers from 1 to 20, and 0.5 to 20 weight percent (b) trialkanolamine of the formula



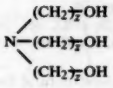
where z is an integer from 1 to 6, with an essentially stoichiometric amount of a di(C_{1-4} alkyl)sulfate.

9. An aqueous solution containing a quaternary ammonium composition obtained by quaternizing a mixture of amines with an essentially stoichiometric amount of a di(C_{1-4} alkyl)sulfate,

said amine mixture containing 80 to 99.5 weight percent alkoxylated ether amine of the formula



where R is an aliphatic hydrocarbon radical having from 2 to 20 carbon atoms, R' is hydrogen or methyl and x and y are integers from 1 to 20 and 0.5 to 20 weight percent trialkanolamine of the formula



where z is an integer from 1 to 6.

4,540,522

PREPARATION OF SUBSTITUTED BENZYLIC HALIDES

John P. Chupp, Kirkwood, and Terry M. Balthazor, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 358,966, Mar. 17, 1982, abandoned. This application Oct. 7, 1983, Ser. No. 539,887

Int. Cl.[3] **C07C** *121/78, 87/60*

U.S. Cl. 260—465 E **22 Claims**

1. A process for the preparation of nuclear substituted benzyl halides which comprises reacting a nuclear substituted benzyl alkyl sulfoxide in the presence of an inert solvent with a nonoxidizing acid halide to produce a nuclear substituted benzyl halide, wherein said benzyl alkyl sulfoxide contains an activating nuclear substituent, ortho or para to the benzylic sulfoxide substituent, said nuclear substituent comprising an activating group having a Hammett sigma (para) constant which is more negative than about −0.20 and having sufficient electron donating properties to stabilize the benzylic carbonium ion upon electrophilic attack on the sulfoxide.

4,540,523

PHENYLALKYLAMINO-STYRYL DYESTUFFS

Hermann Beecken, Berg.-Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

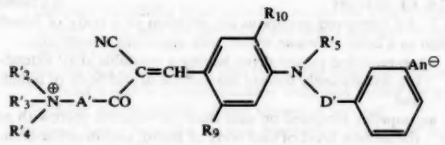
Division of Ser. No. 891,806, Mar. 30, 1978, Pat. No. 4,258,182. This application Oct. 17, 1980, Ser. No. 197,739

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714653

Int. Cl.[3] **C09B** *23/01, 23/04, 23/16;* **D06P** *1/42*

U.S. Cl. 260—465 D **8 Claims**

1. Cationic styryl dyestuff of the formula



wherein

R'_2 denotes C_1–C_4-alkyl, or benzyl or α- or β-phenylethyl unsubstituted or substituted by 1–2 chlorine, C_1–C_4-alkyl or C_1–C_4-alkoxy groups, or cyclopentyl or cyclohexyl unsubstituted or substituted by 1–2 C_1–C_4-alkyl groups,

R'_3 denotes hydrogen or C_1–C_4-alkyl and

R'_4 denotes C_1–C_4-alkyl, or

R'_2, R'_3 and R'_4 together with the nitrogen atom to which they are bonded form imidazole or pyridine which is unsubstituted or substituted by 1 or 2 C_1–C_4-alkyl groups, or

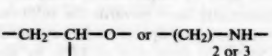
R'_3 and R'_4 together with the nitrogen atom to which they are bonded form piperidine, pyrrolidine, morpholine, piperazine or hexamethyleneimine which is unsubstituted or substituted by 1–4 C_1–C_4-alkyl groups,

R'_5 denotes C_1–C_4-alkyl, or phenyl, benzyl or α- or β-phenylethyl unsubstituted or substituted by 1–2 chlorine, cyano, C_1–C_4-alkyl or C_1–C_4-alkoxy groups, R_9 denotes hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or chlorine and

R_{10} denotes hydrogen or C_1–C_4-alkoxy, or

R'_5 and R_{10} together with the benzene ring and the nitrogen atom to which R'_5 is bonded form an indoline, tetrahydroquinoline or 2,3-dihydro-1,4-benzoxazine radical which is unsubstituted or substituted in the heterocyclic part by 1–4 C_1–C_4-alkyl or phenyl, or form a carbazole, phenoxazine or phenthiazine radical which is unsubstituted or substituted by 1–2 C_1–C_4-alkyl,

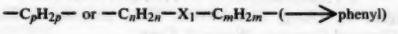
A' denotes



which link via the hetero-atom to the CO group,

R_{11} denotes hydrogen, C_1–C_4-alkyl or phenyl which is unstituted or substituted by 1–2 chlorines or C_1–C_4-alkyls,

D' denotes a direct bond or



in which

m is 0–4,

n is 1–4,

p is 1–4 and

X_1 is O, S, SO_2, COO, OCO, NR_6—CO, CO—NR_6, NR_6—SO_2, SO_2—NR_6, $NCOR_7$, NHCONH, OCO—NH, NH—COO, OCO—CH_2—S, OCO—CH=CH or OCO—CH_2O,

R_6 is H, CH_3, C_2H_5, allyl or benzyl;

R_7 is H or CH_3; and

$An^{\ominus}$ represents an anion,

and wherein the abovementioned alkyl radicals are unsubstituted or substituted by 1–2 chlorine, cyano, C_1–C_4-alkoxy, phenoxy, naphthoxy, benzyloxy, benzoyloxy, allyloxy, C_1–C_4-alkylcarbonyloxy or C_1–C_4-alkoxycarbonyl groups, and the phenyl groups, in turn, are unsubstituted or substituted by 1–2 cyano or C_1–C_4 alkoxy groups.

4,540,524

METHODS FOR PREPARING LOWER ALKYL α-FLUORO-α-CYANOACETATE AND ITS CARBANION

Nobuo Ishikawa, Yokohama, and Akio Takaoka, Kawasaki, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 528,060, Aug. 31, 1983, abandoned. This application Nov. 7, 1984, Ser. No. 669,178

Claims priority, application Japan, Aug. 31, 1982, 57-151003; Aug. 31, 1982, 57-151004

Int. Cl.[3] **C07C** *121/00*

U.S. Cl. 260—465.4 **3 Claims**

1. A process for preparing an alkyl α-fluoro- α-cyanoacetate of the formula:

wherein R is an alkyl containing up to five carbon atoms, preferably 2 or 3 carbon atoms,

which comprises;

(a) reacting hexafluoropropene with ammonia to form 2,3,3,3-tetrafluoropropionitrile, and

(b) reacting the thus obtained 2,3,3,3-tetrafluoropropionitrile with an alkali hydroxide in an alkyl alcohol of the formula ROH.

4,540,525

METHOD FOR PRODUCING 1-NAPHTHOL-4-SULPHONIC ACID

Werner Veit, Langkampfen, Austria, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 597,172, Apr. 5, 1984, abandoned. This application Aug. 30, 1984, Ser. No. 645,942

Int. Cl.³ C07C *143/42*

U.S. Cl. 260—512 C **20 Claims**

1. A method for producing 1-naphthol-4-sulphonic acid in free acid form contaminated with less than 2% by weight of 1-naphthol-2-sulphonic acid, by sulphonating 1-naphthol in a solvent which is substantially inert towards the sulphonating agent and in which 1-naphthol-4-sulphonic acid has a solubility at a temperature >50° C. of from 0.01 to 5.0% by weight, which comprises the step of separating the 1-naphthol-4-sulphonic acid from the reaction mixture by filtration at a temperature >50° C. directly after completion of the sulphonation.

4,540,526

REACTION PRODUCTS OF UNSATURATED HYDROCARBONS WITH P_4S_{10} AND PSX_3

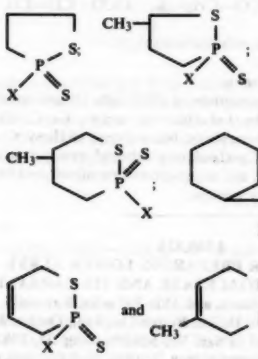
Eugene H. Uhing, Pleasantville, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 252,114, Apr. 8, 1981, abandoned. This application Aug. 11, 1983, Ser. No. 522,881

Int. Cl.³ C07F *9/21, 9/38, 9/34*

U.S. Cl. 260—936 **17 Claims**

1. A composition selected from the group consisting of:

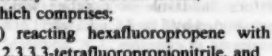


and isomers thereof, wherein X is selected from the group consisting of Cl and Br.

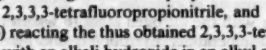
15. A method of preparing reaction products of unsaturated hydrocarbons, P_4S_{10} and PSX_3 wherein X is selected from the group consisting of Cl and Br comprising contacting an unsaturated hydrocarbon reactant of the general formula:

I

wherein R_1, R_2, R_3 and R_4 can be the same or different and are selected from the group consisting of hydrogen, C_1–C_{10} alkyl and C_1–C_{10} alkylene with the proviso that said reactant can be cyclic; and with the further proviso that said reactant is not ethylene; with reactants having the general formulas:



II



III

wherein X is as defined above, at a temperature from about 90° C. to about 250° C. and under autogenous pressure.

4,540,527

PHOSPHITES AND PHOSPHATES OF 3-SULFOXY-1,2-PROPYLENE GLYCOLS

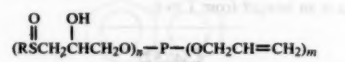
Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 28, 1983, Ser. No. 479,699

Int. Cl.³ C07F *9/09, 9/141*

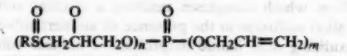
U.S. Cl. 260—949 **4 Claims**

1. A composition of the structural formula



wherein R is selected from the group consisting of an alkyl moiety of 1 to 24 carbon atoms, aryl moieties of 6 to 24 carbon atoms, the ring radicals of said aryl moieties being selected from the group consisting of phenyl, biphenyl, naphthalene, anthracene and phenanthrene radicals, wherein n is a whole number from 1 to 3, m is selected from the group of numbers consisting of 0, 1 and 2, and the sum of n+m is 3.

3. A composition of the structural formula



wherein R is selected from the group consisting of an alkyl moiety of 1 to 24 carbon atoms and aryl moieties of 6 to 24 carbon atoms, the ring radicals of said aryl moieties being selected from the group consisting of phenyl, biphenyl, naphthalene, anthracene and phenanthrene radicals, wherein n is a whole number from 1 to 3, m is selected from the group of numbers consisting of 0, 1 and 2, and the sum of n+m is 3.

4,540,528

APPARATUS FOR MIXING GAS AND LIQUID

Johny H. Haegeman, 122, Steenweg naar Alsemberg, B 1510 Buizingen, Belgium

Continuation-in-part of Ser. No. 456,452, Jan. 7, 1983, Pat. No. 4,468,358, which is a continuation of Ser. No. 278,232, Jun. 29, 1981, abandoned. This application Aug. 28, 1984, Ser. No. 644,898

Claims priority, application Belgium, Jul. 8, 1980, 0/201326

The portion of the term of this patent subsequent to Aug. 24, 2001, has been disclaimed.

Int. Cl.³ B01F *3/04*

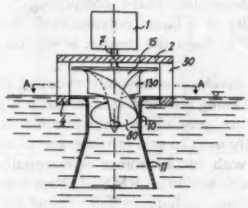
U.S. Cl. 261—91 **6 Claims**

1. An improved apparatus for aeration of a body of liquid such as a body of waste water, said apparatus comprising:

a top-mounted power drive having a rotatable shaft extending downwardly toward the surface of said body of liquid; and

an impeller mounted on said shaft for rotation therewith at the surface level of said body of liquid, said impeller comprising an upwardly, outwardly flared diffusion head forming an impeller body having a lower, axial flow inducing, screw pump portion with at least one blade, said at least one blade being mounted on the lower end of said diffusion head for drawing liquid from said body of liquid and pumping said liquid axially upward at a first velocity; said impeller body also having an upper, centrifugal flow

inducing portion with at least one radially outwardly curved blade, said at least one curved blade being mounted on said diffusion head for receiving said liquid pumped axially upward by said screw pump portion and for centrifugally expelling said liquid outwardly from said impeller at a second velocity and at a position above the surface of said body of liquid, said at least one blade of said screw pump portion being gradually curve into a spiral to



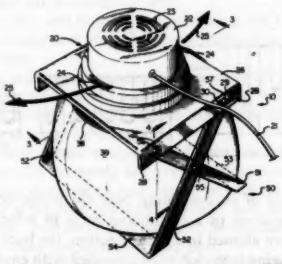
merge into and form said at least one blade of said centrifugal flow inducing portion, whereby said liquid pumped axially upward by said screw pump portion into said centrifugal flow inducing portion is continuously guided and accelerated by said blades as the direction of flow of said liquid changes gradually from axial to centrifugal before said liquid is discharged in a nearly horizontal direction from said centrifugal flow inducing portion.

4,540,529

COMPACT PORTABLE HUMIDIFIER

Kathleen Koszyk, 10 Meadowood La., Northfield, Ill. 60093

Filed Mar. 8, 1985, Ser. No. 709,773
Int. Cl.[3] B01F *3/04*
U.S. Cl. 261—91 **7 Claims**



1. A portable humidifier for use on a table-top comprising:
- a compact humidifier head including means for generating a stream of air and for enriching the water content of said stream of air;
- a flexible bag connected to said humidifier head and adapted to hold water in communication with said means for enriching water content of said stream of air; and
- support legs connected to said humidifier head, said legs being collapsible to a first position to lie immediately below the head and extendible to a second position to support the head a greater, fixed distance above said table-top,

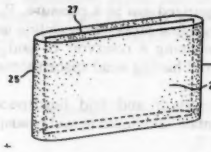
whereby the flexible bag holds sufficient water when said legs are in their second position for distribution into a room over a desired time to achieve effective room humidification.

4,540,530

HUMIDIFIER PAD

Robert A. Wignall, Victoria Harbour, and Samuel Travale, Stoney Creek, both of Canada, assignors to B. D. Wait Co. Limited, Oakville, Canada

Continuation of Ser. No. 459,843, Feb. 21, 1983, abandoned.
This application Jan. 23, 1985, Ser. No. 693,304
Claims priority, application Canada, Oct. 12, 1982, 413241
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—92 **3 Claims**



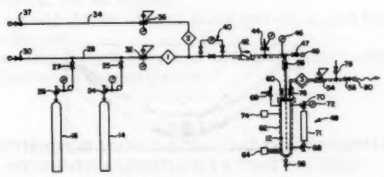
1. A seamless humidifier pad of formed synthetic plastic material, the pad comprising:
- a pair of similar side walls having rectangular shape and having inwardly facing surfaces in contact with one another across the entire surface; and
- a pair of rounded ends, each of the ends blending into and connecting opposite ends of the side walls to one another, the thickness of each of the rounded ends being a maximum at the junctions with the side walls and a minimum in a plane containing said surfaces, whereby upon deforming the pad by stretching the pad onto a cylindrical support, the pad exhibits a substantially uniform cylindrical outer surface.

4,540,531

VAPOR GENERATOR AND ITS USE IN GENERATING VAPORS IN A PRESSURIZED GAS

Timothy Y. Moy, Dublin, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed May 4, 1984, Ser. No. 607,248
Int. Cl.[3] B01F *3/04*
U.S. Cl. 261—141 **10 Claims**



1. Generator for generating a supply of a gas bearing vapors of a compound at a desired concentration, said supply being generated on demand at a desired constant delivery pressure, P_d, which comprises:
- a gas inlet line for conveying pressurized gas at a pressure, P_s, from a source thereof through first pressure regulator means to a vessel;
- said vessel retaining a reservoir of said compound in its liquid phase and headspace thereabove, said vessel being insulated and having heating means to maintain said liquid and said headspace at a desired temperature, T_v;
- said gas inlet line extending into said vessel to a position within said reservoir of liquid and there being terminated with gas distributor means;
- said vessel being provided with an overhead vapors outlet from said headspace for withdrawing said gas bearing vapors of said compounds generated in said vessel; and

a gas outlet line connected from said vessel vapors outlet to second pressure regulator means,

said first pressure regulator means independently controlling the pressure in said vessel, P_v, said second regulator means independently controlling the delivery pressure, P_d, of said gas bearing said vapors, and said desired concentration of vapors in said supply of outlet gas being determined by said vessel pressure, P_v, and said vessel temperature, T_v.

5. A method for generating a supply of a gas bearing vapors of a compound at a desired concentration, said supply being generated on demand at a desired constant delivery pressure, P_d, which comprises:

conveying pressurized gas at a pressure, P_p, from a source thereof through first pressure regulating means to a vessel, said vessel retaining a reservoir of said compound as a liquid phase and having head space thereabove and being insulated;

heating said reservoir and said headspace with heating means to maintain said liquid in said headspace at a desired temperature, T_v;

contacting said gas with said reservoir through said gas line which extends into the vessel to a position within said reservoir of liquid, said contact being through gas distributor means which are disposed about the end of said gas line within said reservoir;

withdrawing said supply of said gas bearing said vapors from a vessel vapors outlet which is in communication with said head space; and

passing said supply through a gas outlet line to second pressure regulating means,

said first regulator means independently controlling the pressure in said vessel and said second pressure regulator means independently controlling said delivery pressure, the desired concentration of vapors in said supply of outlet gas being determined by the vessel pressure and the vessel temperature.

4,540,532

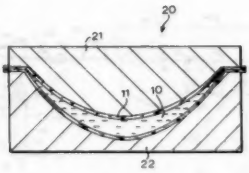
METHOD AND APPARATUS FOR MOLDING OPHTHALMIC LENSES

Donald H. Petcen, Colonial Heights, Va., and Robert I. Sinclair, Mendham, N.J., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed Feb. 2, 1984, Ser. No. 576,181

Int. Cl.³ B29D *11/00*

U.S. Cl. 264—1.1 **8 Claims**



1. A method for making a molded polymeric article which comprises the steps of

(a) providing a mold assembly, for making a molded polymeric article having a predetermined shape, comprising

(i) a quantity of a liquid polymerizable monomer mixture sufficient to form the desired article on polymerization thereof;

(ii) a thin envelope completely encasing the mixture, the envelope being characterized in that it is flexible at room temperature, essentially impermeable to oxygen, and chemically inert to said mixture, and in that its surface in contact with the monomer is essentially dust-free and conforms to within an RMS of about 1 micro-inch; and

(iii) mold means, including a pair of mold halves disposed on opposing sides of the envelope, for forcing the envelope and its contents to conform to the inner surfaces of both mold halves, provided that the interface between the mold halves and the envelope is essentially dust-free,

(b) polymerizing the monomer mixture while applying to the envelope pressure which is sufficient to force the envelope and its contents to conform to the inner surfaces of both mold halves, and

(c) continuing the application of pressure at least until the material in the envelope is capable of retaining the desired molded shape without the application of pressure.

3. A mold assembly, for making a molded polymeric article having a predetermined shape, comprising

(i) a quantity of a liquid polymerizable monomer mixture sufficient to form the desired article on polymerization thereof;

(ii) a thin envelope completely encasing the mixture, the envelope being characterized in that it is flexible at room temperature, essentially impermeable to oxygen, and chemically inert to said mixture, and in that its surface in contact with the monomer is essentially dust-free and conforms to within an RMS of about 1 micro-inch; and

(iii) mold means, including a pair of mold halves disposed on opposing sides of the envelope, for forcing the envelope and its contents to conform to the inner surfaces of both mold halves, provided that the interface between the mold halves and the envelope is essentially dust-free.

4,540,533

METHOD OF ENCAPSULATING ELECTRONIC COMPONENTS BY EXTRUSION OF PLASTIC MATERIAL

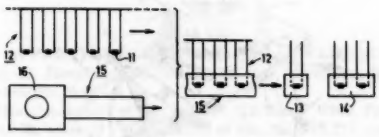
Diran-Robert Sahakian, Noisy-le-Sec, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 26, 1983, Ser. No. 545,551

Claims priority, application France, Oct. 29, 1982, 82 18253; Jun. 27, 1983, 83 10571

Int. Cl.³ B29F *3/10*

U.S. Cl. 264—1.4 **20 Claims**



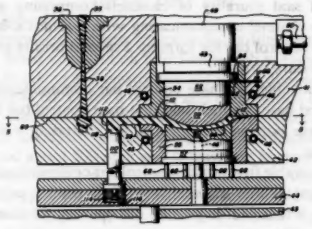
1. A method of encapsulating bare electronic components present in the form of a continuous strip in which the said components are aligned in a first direction, the bare electronic components being intended to be provided with envelopes of a defined profile obtained by extrusion, in a direction parallel to the said first direction, of at least one plastic material by means of an extrusion head, characterized in that the method of encapsulation is carried out for components with rigid connection wires extending in a second direction substantially at right angles to the first direction in which the components are aligned, in that the bare electronic components (**11**) are continuously inserted and immobilized in the envelopes of said profile so that the encapsulation is limited to the components (**11**) excluding the rigid connection wires, and in that in a final operation common sections of plastic material (**15**) extruded from said extrusion head, in which the aligned components are inserted and immobilized and of the continous strip (**12**), are cut so that the bare electronic components (**11**) provided with their envelopes (**13, 14**) are mutually separated.

4,540,534

APPARATUS AND METHOD FOR INJECTION MOLDING LENSES

Clark L. Grendol, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Oct. 11, 1983, Ser. No. 540,867
Int. Cl.[3] B29D *11/00*
U.S. Cl. 264—2.2 27 Claims



1. A method for forming a thermoplastic optical lens blank in an injection molding apparatus where said apparatus includes an optical cavity for defining said optical lens blank comprising the steps of:

injecting an amount of molten plastic in excess of that required for molding the lens into said cavity through an aperture along the edge of said cavity when said cavity has a volume greater than said optical lens, said greater volume to assure better flow into the thinner section of said cavity and

compressing said cavity such that the thickness of said cavity is decreased so as to define said optical lens blank, thereby causing a flow of molten plastic from said optical cavity back through said aperture;

whereby an optical lens free of knit lines is formed.

27. An apparatus for injection molding a lens comprising:

a housing;

a pair of dies disposed within said housing, said dies defining a cavity for receiving an amount of molten plastic therein, said amount being in excess of an amount of molten plastic required for molding the lens;

means within said housing for permitting the relative movement of said dies such that the volume of said cavity may be varied;

injection molding means communicating with said cavity for injecting said excess amount of plastic into said cavity, said injection molding means communicating with said cavity through an inlet port;

compression means coupled to at least one of said dies for sequentially reducing the volume of said cavity and for applying pressure to said plastic in said cavity after said plastic is injected through said inlet port into said cavity causing a portion of said plastic to be transferred from said cavity back through said inlet port;

means for cutting off the flow of molten plastic into said cavity comprising a piston for isolating the cavity from said injection molding means while in a first position, and allowing passage of molten plastic from said injection molding means to said cavity while in a second position;

means to accommodate said molten plastic transported from said cavity back through said inlet port, said accommodating means comprising

a second spring-loaded piston housed within an elongated reservoir; and a stop means for locking said second piston in a first position;

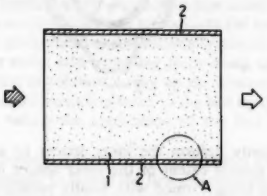
whereby molten plastic may be injected into said cavity, and then the volume of said cavity may be decreased forcing molten plastic from said cavity back through said inlet port where when said piston is locked in said first position and pressure is applied to said piston, excess molten plastic is prevented from entering said reservoir and when said piston is released, the pressure of the excess molten plastic will depress said piston thereby filling said reservoir with molten plastic.

4,540,535

METHOD FOR PRODUCING A CERAMIC FILTER FOR CLEANING EXHAUST GASES FROM A DIESEL ENGINE

Masahiro Tomita, and Shigeru Takagi, both of Anjo, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 370,348, Apr. 21, 1982, Pat. No. 4,436,538.
This application Jan. 31, 1984, Ser. No. 575,575
Claims priority, application Japan, Apr. 22, 1981, 56-61824; Apr. 24, 1981, 56-62787; Apr. 28, 1981, 56-64432
Int. Cl.[3] C04B *21/08, 39/12;* B01D *39/20*
U.S. Cl. 264—44 15 Claims



1. A method for producing a filter composed of an exhaust gas cleaning portion which collects carbon particulates in the exhaust gases emitted from a diesel engine and has an outer peripheral side surface and an outer wall portion which is formed around said side surface so as to be integral therewith, and of which the bulk density is greater than that of said cleaning portion and increases continuously toward the outer surface of said wall portion; comprising the steps of:

immersing an organic foamed body having a three dimensional network structure provided with a large number of interconnected fine pores into a ceramic slurry bath to adhere said slurry to said foamed body so as not to close said pores;

spraying the same kind of slurry as said ceramic slurry into the outer peripheral side surface of said foamed body to which said ceramic slurry is adhered until the pores opening to said outer peripheral side surface of said foamed body are closed thereby;

drying said slurries adhered to and sprayed on said foamed body; and

firing said foamed body and said dried slurries adhered thereto and sprayed thereon.

4,540,536

METHOD OF MANUFACTURING TRANSFORMER WINDINGS EMBEDDED IN CASTING RESIN

Gerhard Altmann, Kirchheim; Wolfgang Bendel, Leonberg; Rudolf Dedelmahr, Aischtal, and Richard Pfeiffer, Stein-Deutenbach, all of Fed. Rep. of Germany, assignors to Transformatoren Union Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,778
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3234098
Int. Cl.[3] B29C *6/02*
U.S. Cl. 264—102 11 Claims

1. Method for manufacturing a transformer winding embedded in casting resin by winding coils, respectively by themselves and independently of one another for disposition thereof in tandem in axial direction of the winding; placing the wound coils in a substantially annular casting mold having an inner and an outer jacket, with respective impregnated corrugated mats of insulating material as spacers disposed between the inner jacket and the coils as well as between the coils and the

outer jacket, the inner and the outer jackets being fixed between mold end walls at respective ends of the casting mold; disposing the casting mold containing the wound coils in an evacuated chamber and pouring casting resin into the casting mold through an axially parallel slot formed in the outer jacket thereof; and permitting the casting resin to harden at least partly in the mold at elevated temperature and at a pressure at least equal to atmospheric pressure; which comprises spreading the inner jacket of the casting mold in radial direction so as

to permanently deform the inner spacer to a dimension at which the radical extent of the inner spacer is reduced, the inner jacket being formed with axially parallel edges at ends thereof overlapping in circumferential direction and slidable on one another during the deformation so as to spread the inner jacket in radial direction, fixing the coils of the winding on the inner spacer against movement in axial direction; and surrounding respective edges at the end of the inner and the outer jackets with an elastic layer at the inner face of the respective mold end walls.

4,540,537

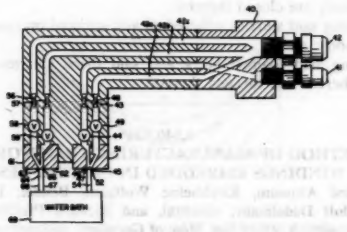
METHOD AND EXTRUDING DIE APPARATUS FOR PRODUCING A PLASTIC CLOSURE STRIP

Ewald A. Kamp, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 196,327, Oct. 14, 1980, abandoned, which is a continuation of Ser. No. 25,665, Mar. 30, 1979, abandoned. This application Mar. 1, 1984, Ser. No. 583,495

Int. Cl.³ B29F *3/04*

U.S. Cl. 264—171 **35 Claims**



1. A coextrusion apparatus for use with extruder means for forming a plurality of combined interlocking closure strips having profile portions and base portions, comprising, in combination:

(a) extruder channels communicating with said extruder means for receiving a plurality of plastic feed materials under pressure from said extruder means.

(b) flow diverter means communicating with said extruder channels, and adapted to establish alternate distribution patterns for said plastic feed materials, said flow diverter means comprising at least a first base channel for receiving a first plastic feed material and communicating with a removable first base control bar for forming a first base portion of said closure strips, said flow diverter means further comprising a plurality of channels for receiving a second plastic feed material, one of said plurality of channels comprising a first profile channel communicating with a removable first profile control bar for forming a first profile portion of said closure strips, one of said plurality of channels comprising a second base channel communicating with a removable second base control bar for forming a second base portion of said closure strips, and one of said plurality of channels comprising a second profile channel communicating with a removable second profile control bar for forming a second profile portion of said closure strips;

(c) a removable first base control bar communicating with said first base channel, said first base control bar having a first base portion die opening for extruding a first base portion;

(d) a removable first profile control bar communicating with said first profile channel, said first profile control bar having a first profile portion die opening for extruding a first profile portion;

(e) a removable second base control bar communicating with said second base channel, said second base control bar having a second base portion die opening for extruding a second base portion; and

(f) a removable second profile control bar communicating with said second profile channel, said second profile control bar having a second profile portion die opening for extruding a second profile portion.

21. A method for coextruding a plurality of combined interlocking closure strips having profile portions and base portions, comprising the steps:

(a) extruding a plurality of plastic feed materials under pressure into extruder channels communicating with a flow diverter means;

(b) establishing alternate distribution patterns for said plastic feed materials with said flow diverter means whereby the plastic feed materials from one of said extruder channels passes to a first channel communicating with a removable first control bar for forming a first base portion of a first closure strip, and the plastic feed materials from another of said extruder channels passes to a plurality of channels, wherein one of said plurality of channels comprises a second channel communicating with a removable second control bar for forming a first profile portion of said first closure strip, one of said plurality of channels comprises a third channel communicating with a removable third control bar for forming a second base portion of a second closure strip, and one of said plurality of channels comprises a removable fourth channel communicating with a fourth control bar for forming a second profile portion of said second strip;

(c) passing said plastic feed material from said first channel to the die opening for said removable first control bar, and extruding a first base portion of a first closure strip therefrom;

(d) passing said plastic feed material from said second channel to the die opening of said removable second control bar, and extruding a first profile portion of said first closure strip therefrom;

(e) passing said plastic feed material from said third channel to the die opening of said removable third control bar, and extruding a second base portion of a second closure strip therefrom; and

(f) passing said plastic feed material from said fourth channel to the die opening of said removable fourth control bar, and extruding a second profile portion of said second closure strip therefrom.

4,540,538

ANTI-BLOCK COMPOUNDS FOR EXTRUSION OF TRANSITION METAL CATALYZED RESINS

Michael A. Corwin, Millington, and George N. Foster, Bloomsbury, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 309,658, Oct. 8, 1981, Pat. No. 4,412,025, which is a continuation-in-part of Ser. No. 242,457, Mar. 11, 1981, abandoned. This application Oct. 19, 1983, Ser. No. 543,481

Int. Cl.³ D01F 1/02

U.S. Cl. 264—211 2 Claims

1. An improved process for extruding a film forming olefin polymer based composition into film which is essentially free from gel streaking and pinstriping and which does not discolor upon aging at 60° C. for 4 weeks, said composition comprising a Ziegler-Natta catalyzed film grade olefin polymer containing a chloride catalyst residue having a concentration between about 5 and about 500 ppm and at least one hindered phenolic anti-oxidant having a concentration between about 20 and about 5000 ppm, which composition is susceptible to gel streaking/pinstriping during the formation of said film, the improvement which comprises:

Extruding said composition into said film in the presence of at least one anti-gel compound and at least one inorganic anti-block compound, said anti-gel compound being characterized by having at least about 5 repeat units of an alkylene oxide and being present in a concentration sufficient to neutralize said chloride catalyst residue in said composition, said concentration of said anti-gel compound being at least about 0.8 times the concentration of said hindered phenolic anti-oxidant, said anti-gel compound having a molecular weight between about 200 and about 4,000,000 Daltons; said inorganic anti-block compound having a concentration between about 500 ppm and about 5% by weight and having a pH of between 6 and 8.

4,540,539

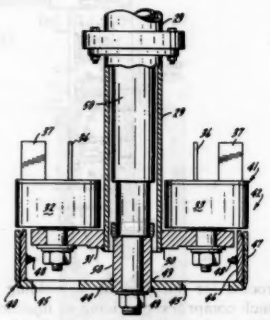
METHOD AND APPARATUS FOR PRODUCTION OF CONCRETE PIPE BY THE PACKERHEAD METHOD

Gerald R. Crawford, Sergeant Bluff, and Brian J. Kozlowski, Sioux City, both of Iowa, assignors to International Pipe Machinery Corp., Sioux City, Iowa

Filed Dec. 21, 1982, Ser. No. 451,666

Int. Cl.³ B28B 21/26

U.S. Cl. 264—269 8 Claims



1. In a wire reinforced concrete pipe making machine,

means for inserting a reinforcing wire cage in said concrete pipe mold,

a bi-directional packerhead assembly, said bi-directional packerhead assembly consisting of

a longbottom,

means for causing rotation of said longbottom in a first direction as said bi-directional packerhead traverses a reinforcing wire cage located within a concrete pipe mold,

a rollerhead,

said rollerhead consisting of

a roller carrying assembly and

a plurality of rollers mounted on said roller carying assembly, and

means for causing rotation of said rollerhead in a direction opposite to the direction of rotation of the longbottom at a peripheral speed such as to counteract the twist imposed on the reinforcing wire cage as said bi-directional packerhead traverses the reinforcing wire cage located within said concrete pipe mold.

5. A high speed method of making reinforced concrete pipe comprising the steps of

traversing a packerhead vertically through a reinforcing wire cage located within a concrete pipe mold,

applying a first troweling force to concrete fed to the upper side of the packerhead and centrifically placed about the cage in the mold, said troweling force being applied in a first direction of rotation, to lay up the concrete,

applying a second troweling force to the laid up concrete at a location below the application of the first troweling force,

said second troweling force being applied in a direction of rotation opposite to that of the first direction of rotation at a peripheral speed such as to counteract the twist imposed on the reinforcing wire cage,

said first and second troweling forces being applied to the concrete by means carried by the packerhead.

4,540,540

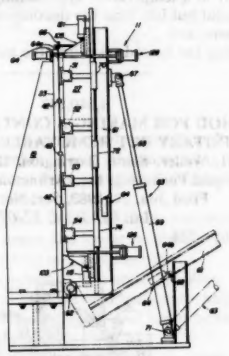
METHOD FOR MOLDING ELONGATED WORKPIECES

Robert C. Jackson, Cedar Falls, and Patrick M. Luchsinger, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 305,298, Sep. 22, 1981,. This application Mar. 26, 1984, Ser. No. 593,446

Int. Cl.³ B29F 1/10

U.S. Cl. 264—272.11 4 Claims



1. In a method of molding an elongated workpiece comprising the steps of:

providing a mold with three generally vertically oriented quadrants and with a fourth quadrant vertically pivotably mounted relative to said three vertical quadrants for movement between an inclined mold open position and a generally vertically oriented mold closed position,

releasably fixing an elongated workpiece core to said fourth quadrant when it is located in said mold open position, and

moving said fourth quadrant, with the core affixed thereto, to said mold closed position.

4,540,541

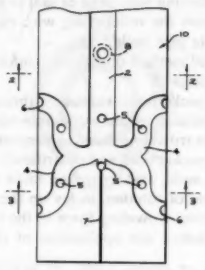
METHOD FOR MAKING PLASTIC ARTICLES FROM RESIN

James H. Harding, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Division of Ser. No. 361,996, Mar. 25, 1982, Pat. No. 4,451,224. This application Dec. 29, 1983, Ser. No. 566,796

Int. Cl.³ B28B *1/24*

U.S. Cl. 264—328.2 **9 Claims**



1. In a method of forming a plastic article from resin in a heated mold assembly comprising passing heated, flowable resin under pressure from a resin supply means through a flow passageway to a mold cavity, the improvement comprising:

(a) passing the heated, flowable resin into a runner block assembly wherein the flow passageway is at least one channel connected to the resin supply means, the channel extending from the resin supply means to the mold cavity and having a large heated surface with a thin, flat cross-section with two opposite sides thereof having a length substantially less than the length of the other two sides so that the channel has a cross-section sufficient to provide shear resistance resulting from forcing the resin under pressure through the channel;

(b) heating the resin in the channel of the runner block/assembly at a temperature approaching the temperature of the mold but less than the decomposition temperature of the resin; and

(c) passing the heated resin into the mold cavity.

4,540,542

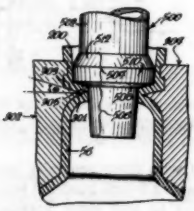
METHOD FOR MAKING A CONTAINER WITH A UNITARY BUT REMOVABLE CLOSURE

Gerhard H. Weiler, South Barrington, Ill., assignor to Automatic Liquid Packaging, Inc., Arlington Heights, Ill.

Filed Jun. 29, 1983, Ser. No. 508,734

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—524 **3 Claims**



1. In a method for molding a container from an extruded length of a parison of semi-soft thermoplastic material in the form of a vertically oriented, elongated, hollow tube wherein said method includes the steps of: (A) closing about said parison a main mold means for defining cavity for subsequently forming the container body with an open top, (B) maintaining an opening at the top of the length of parison in a portion of the parison extending upwardly above the closed main mold means, (C) forming a peripheral frangible web in said parison below said top opening and also temporarily sealing the top opening of the parison, (D) molding the container by a pressure differential between the exterior of the parison in said main mold means and the interior of said parison, and (E) thereafter sealing the top of the formed container with a sealing mold, the improvement characterized in that

step (A) includes providing in said main mold means a circumferential portion that projects inwardly into the cavity and defines a forming edge and an upwardly facing bearing surface;

step (C) includes providing a mandrel with a downwardly facing frustoconical sealing surface and a frustoconical engaging surface extending downwardly and inwardly from said sealing surface and extending said mandrel into said parison top opening to (1) force said parison against said main mold means bearing surface with said mandrel sealing surface, and (2) sweep and squeeze said parison adjacent said main mold means forming edge with said mandrel engaging surface; and

step (D) includes maintaining said mandrel at a maximum extended position in contact with said parison to (1) effect a temporary seal of said mandrel sealing surface against the parison and of the parison against said closed main mold means bearing surface during molding of the container, and (2) locate said mandrel engaging surface relative to said forming edge of the closed main mold means to retain therebetween a reduced thickness section of a parison whcih, upon subsequent retraction and upon subsequent formation of the sealed top of the container, defines a peripherl frangible web below the sealed container top.

4,540,543

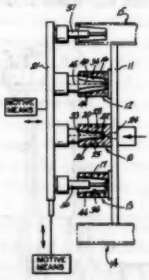
INJECTION BLOW MOLDING PROCESS AND APPARATUS

Tommy Thomas, Toronto, and John W. West, Oakville, both of Canada, assignors to Canada Cup, Inc., Toronto, Canada

Filed Jun. 11, 1984, Ser. No. 618,956

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—526 **21 Claims**



1. A process for injection blow molding hollow plastic articles which comprises: providing an injection mold including a mold cavity formed by a mold wall and a core; injecting molten plastic into said cavity to form a parison on said core; separating said parison from said mold wall by moving said parison on said core axially in a straight path away from said mold wall; providing a blow mold adjacent said mold cavity in side-by-side relationship therewith; moving said parison on said core in a substantially arcuate path into axial alignment with said blow mold; moving said parison on said core axially in a straight path into said blow mold; expanding said parison on said core in said blow mold to form said hollow article;

separating said core from said hollow article in said blow mold and leaving said hollow article in said blow mold by moving said core axially in a straight path away from said blow mold, followed by moving said core in a substantially arcuate path into axial alignment with said mold wall and moving said core axially on a straight path into said mold wall for repeat of the cycle; providing a plane defined by the axes of the injection mold cavity and of said blow mold, wherein said arcuate path is coplanar with said plane and includes an arcuate section in which a change of velocity of said core takes place and a linear section of constant velocity.

13. Apparatus for injection blow molding hollow plastic articles which comprises: an injection mold including a mold wall; a core engageable with said injection mold to form a mold cavity with said mold wall; means to inject molten plastic into said mold cavity to form a parison therein; a blow mold adjacent said mold cavity in side-by-side relationship therewith; means to separate said parison from said mold wall operative to move said parison on said core axially in a straight path away from said mold wall followed by movement in a substantially arcuate path into axial alignment with said blow mold, followed by axial movement in a straight path into said blow mold; and means to expand said parison on said core in said blow mold to form said hollow article; means for separating said core from said hollow article in aid blow mold and leaving said hollow article in said blow mold by moving said core axially in a straight path away from said blow mold, followed by moving said core in a substantially arcuate path into axial alignment with said mold wall and moving said core axially on a straight path into said mold wall for repeat of the cycle; the axes of the injection mold and of the blow mold defining a plane that is coplanar with the plane of said arcuate path including an arcuate section during which a change of velocity of said core takes place and a linear section of constant velocity.

4,540,544

METHOD OF PRODUCING A BIAXIALLY ORIENTED CONTAINER OF POLYETHYLENE TEREPHTHALATE OR SIMILAR MATERIAL

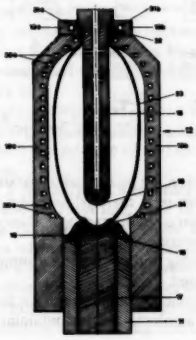
Kjell M. Jakobsen, Skanor, and Claes T. Nilsson, Loddeköpinge, both of Sweden, assignors to PLM AB, Malmo, Sweden

Division of Ser. No. 264,829, May 18, 1981, Pat. No. 4,467,929. This application Apr. 29, 1983, Ser. No. 489,733

Claims priority, application Sweden, May 29, 1980, 8004003; Dec. 10, 1980, 8008650

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—532 **23 Claims**



1. A method of forming a container from orientable thermoplastic material comprising:

providing a hollow preform of thermoplastic material including a side wall and a closed end, the material of said side wall having axial orientation and being capable of circumferential expansion and circumferential orientation,

positioning the preform in a mold having a movable mold part,

expanding the preform in the mold to form the container,

said preform, prior to its formation to the finished shape of said container, coming into contact with said movable mold part without any axial stretching of said side wall, and

displacing the closed end portion of the preform by said movable mold part in correspondence with the expanding of the preform such that the material of the side wall is not stretched in a plane perpendicular to the direction of expanding and thereby the material does not undergo any axial strain due to elongation and said expanding produces circumferential stretching and circumferential orientation of the material in said side wall independent of and superimposed on said axial orientation.

4,540,545

DEVICES FOR SECURING FUEL ASSEMBLIES TO NUCLEAR REACTOR PRESSURE VESSELS

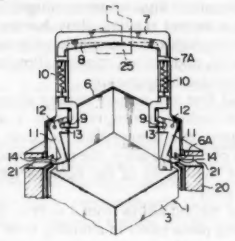
Hirofumi Kondo, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed May 19, 1982, Ser. No. 379,777

Claims priority, application Japan, May 26, 1981, 56-79727

Int. Cl.³ G21C *3/30, 19/10*

U.S. Cl. 376—364 **4 Claims**



1. In a nuclear system having a fuel assembly and a grid, for securing said fuel assembly to said grid comprising:

upper and lower tie plates for supporting said fuel assembly at its upper and lower end portions;

spacers for supporting said fuel assembly at intermediate portions between said upper and lower tie plates;

a channel box surrounding said fuel assembly;

a stationary handle attached to said upper tie plate;

a movable handle mounted on said stationary handle to be vertically slidable between upper and lower positions with respect thereto;

said movable handle having substantially the same shape as said stationary handle;

spring means having one end connected to said stationary handle and the other end connected to said movable handle for always downwardly urging said movable handle; and

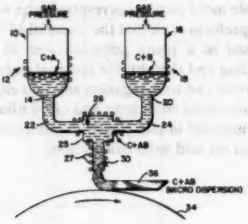
locking means mounted on said stationary handle to be pivotable in accordance with vertical movement of said movable handle, said locking means engaging with said movable handle and said grid said grid supporting said fuel asembly at its upper portion and said locking means being operatively secured to said grid when said movable handle is lowered and being disengaged therefrom when said movable handle is in said upper position.

4,540,546

METHOD FOR RAPID SOLIDIFICATION PROCESSING OF MULTIPHASE ALLOYS HAVING LARGE LIQUIDUS-SOLIDUS TEMPERATURE INTERVALS

Bill C. Giessen, Cambridge, Mass., assignor to Northeastern University, Boston, Mass.

Filed Dec. 6, 1983, Ser. No. 558,612
Int. Cl.³ C22C *1/02*; C21C *5/56*
U.S. Cl. 420—590 **42 Claims**



1. A method of rapidly solidifying an alloy having a liquidus-solidus temperature interval incompatible with the formation of microdispersions by rapid solidification processes, the completely solidified alloy having a dispersion in a host matrix of a constituent of 10 nanometers to 0.1 micron, made from components which have been chemically reacted together, comprising the steps of:

providing a first starting alloy having a solvent and a chemically reactable component, said first starting alloy having a predetermined liquidus temperature;

providing a second starting alloy having a solvent and a component chemically reactable with said first mentioned component, said second starting alloy having a predetermined liquidus temperature;

melting said first and second starting alloys;

mixing said melted starting alloys in a melt mix reaction mixing zone at a temperature less than the liquidus temperature of the final alloy, the mixing temperature being at or above the higher of the liquidus temperatures of the starting alloys;

ejecting the melted alloys from a nozzle, the chemical reaction taking place either in a mixing zone or nozzle or both or later, but with the mixing time controlled by the mixing zone and nozzle to provide a sufficiently short dwell time until solidification such that the subsequent cooling period for the rapid solidification of the mixed starting alloys is short enough to provide a macroscopic homogeneous dispersion of submicron particles of the constituent in the host; and

rapidly solidifying the ejected alloys to produce a completely solidified alloy having a dispersion of the constituent in the host which comprises said solvents.

4,540,547

MOVING BED REACTOR

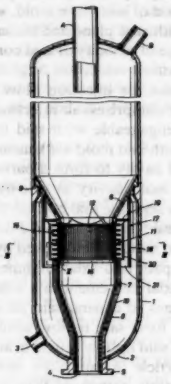
Pieter J. Schuurman, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 390,452, Jun. 21, 1982, abandoned. This application Jul. 9, 1984, Ser. No. 627,506
Claims priority, application United Kingdom, Jun. 30, 1981, 8120176
Int. Cl.³ B01J *8/12*
U.S. Cl. 422—49 **12 Claims**

1. A moving catalyst bed reactor comprising

a vertical vessel having separate inlets for reactant and solid catalyst in the upper portion of the vessel, both of said inlets communicating with a contact space in said vessel;

catalyst bed support means defining, with the walls of the vessel, a portion of the contact space in the lower portion of the vessel, said support means comprising a first downwardly converging conical surface having an opening in the lower end thereof, vertical channel means communicating, at one end thereof, with said opening, said channel means terminating in and communicating, at the other end thereof, with a second downwardly converging conical surface having an opening in the lower portion thereof,



said channel means radially communicating through a plurality of independently laterally displaceable vertical screen sections therein with a fluid effluent outlet;

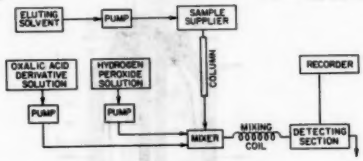
and an outlet for catalyst communicating with the opening in the lower end of the second downwardly converging conical surface.

4,540,548

METHOD OF DETECTING FLUORESCENT MATERIALS AND APPARATUS FOR THEIR DETECTION

Kazuhiro Imai; Tamura Zenzo, both of Tokyo, and Kobayashi Shin-Ichiro, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 292,487, Aug. 13, 1981, which is a division of Ser. No. 80,294, Oct. 1, 1979, abandoned. This application Jun. 2, 1983, Ser. No. 499,417
Claims priority, application Japan, Apr. 3, 1979, 55-39922
Int. Cl.³ G01N *31/08, 21/76*
U.S. Cl. 422—52 **2 Claims**



1. In combination, an analytical apparatus for the quantitative determination of a material selected from the group of polycyclic aromatic hydrocarbons, dansylamino acids and vitamins in a mixture comprising:

(a) means defining and containing a supply of said materials to be separated;

(b) a liquid column chromatograph for separating said material to form a column eluate containing the separated said material;

(c) said material separating means in said chromatographic column;

(d) a first mixing zone;

(e) means defining and containing a supply of oxalic acid derivative reagent;

(f) means for passing a solution of an oxalic acid derivative to said first mixing zone at a controlled rate;

(g) means defining and containing a supply of hydrogen peroxide reagent;

(h) means for passing a solution of hydrogen peroxide to said first mixing zone at a controlled rate;

(i) means for simultaneously introducing the separated solution, oxalic acid derivative reagent and hydrogen peroxide into said first mixing means;

(j) means in said first mixing zone to mix said column eluate, said oxalic acid derivative, and said hydrogen peroxide to form a first mixture;

(k) a coiled mixing zone through which said first mixture is continuously passed to form a second mixture, whereby chemiluminescence occurs; and

(l) a light-free detecting section comprising a flow cell and a light receptive detection means for perceiving and multiplying the light produced by the chemiluminescence reaction.

4,540,549

CHEMICAL ANALYZING APPARATUS

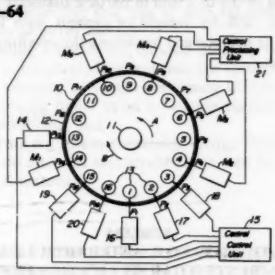
Sugio Manabe, Kodaira, Japan, assignor to Olympus Optical Company Ltd., Japan

Continuation of Ser. No. 359,934, Mar. 19, 1982, abandoned. This application Dec. 21, 1984, Ser. No. 684,170

Claims priority, application Japan, Mar. 24, 1981, 56-41640

Int. Cl.³ G01N *21/13, 21/77, 35/04*

U.S. Cl. 422—64 **11 Claims**



1. A chemical analyzer comprising

means including a turntable for defining a circular reaction line and transporting a plurality of reaction vessels along said circular reaction line;

means for rotating said turntable in a backward direction by n pitches and in a forward direction by n+1 pitches repeatedly to advance said reaction vessels in the forward direction step by step;

means for delivering a sample and at least one reagent into successive reaction vessels to form in each reaction vessel a test liquid which is a mixture of said sample and said at least one reagent;

means including a plurality of measuring units arranged along said circular reaction line, each of said measuring units measuring each test liquid twice to produce two measured values when a reaction vessel containing a relevant test liquid is stopped at a relevant measuring unit between successive backward and forward movements and between successive forward and backward movements of said reaction vessels along said circular reaction line; and

means for receiving two measured values for a test liquid supplied from each of said measuring units to derive a difference between said two measured values supplied from each of said measuring units to derive analytic results for each test liquid.

4,540,550

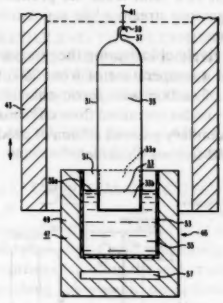
APPARATUS FOR GROWING CRYSTALS

Walter E. Gaida, East Pittsburgh, and Zoltan K. Kun, Churchill, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 29, 1982, Ser. No. 437,779

Int. Cl.³ C30B *11/00*

U.S. Cl. 422—109 **7 Claims**



1. A temperature control apparatus for maintaining a portion of a seed crystal at a predetermined temperature which is less than the liquefaction temperature of the seed crystal throughout the crystal growing process, said temperature control apparatus being adapted to receive therein a crystal growth vessel with the seed crystal disposed therein for use in combination with a travelling furnace adapted to be movable relative to the crystal growth vessel disposed in said temperature control apparatus, said furnace defining a chamber of a predetermined cross-sectional dimension, in which chamber a temperature profile greater than the liquefaction temperature of the seed crystal is established, said temperature control apparatus comprising;

a base dimensioned to be received with the chamber defined by the travelling furnace, said base having a reservoir therein, said reservoir having a depth and cross-sectional dimension sufficient to receive therein at least a portion of the seed crystal containing section of the crystal growth vessel; and

a metallic material disposed in said reservoir and forming therein a substantially liquid pool at a temperature which is less than the seed crystal liquefaction temperature throughout the crystal growing process in intimate contact with the crystal growth vessel section, said metallic material having good thermal conductivity in the liquid state and the remaining in the liquid state at a temperature lower than the liquefaction temperature of the seed crystal wherein the portion of the seed crystal containing section of the crystal growth vessel disposed in said metallic material is at a temperature lower than its melting point independent of the travelling furnace temperature profile with respect to said base.

4,540,551

TWO STAGE CHLORINATION OF TITANIFEROUS ORE WITH $FECL_3$ RECLAMATION

James P. Bonsack, Aberdeen, and Semyon D. Fridman, Randallstown, both of Md., assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 638,977, Aug. 8, 1984,. This application Mar. 1, 1985, Ser. No. 707,196

Int. Cl.³ C01G *23/02*

U.S. Cl. 423—77 **13 Claims**

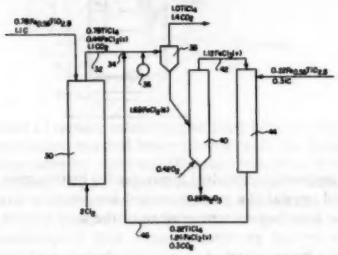
1. A process for making $TiCl_4$ from an iron containing titaniferous ore comprising:

(a) nonselectively chlorinating 60% to 90% of said ore in the

presence of carbon with chlorine in a conventional fluid bed chlorinator under conventional fluid bed chlorination conditions at a temperature of from 800° to 1100° C. to yield a primary gaseous stream containing $TiCl_4$, carbon oxides, and either $FeCl_2$ or $FeCl_3$, or a mixture thereof;

(b) cooling the primary gaseous stream from (a) above to a temperature below 325° C. sufficient to separate iron chloride(s) as a solid from the product $TiCl_4$-containing primary gaseous stream while maintaining the $TiCl_4$ in the vapor state;

(c) nonselectively chlorinating the remaining 10% to 40% of the ore at a temperature of from 900° to 1400° C. in the presence of carbon with ferric chloride vapor from step (h) below, under entrained flow chlorination conditions to yield a secondary gaseous stream of product $TiCl_4$, carbon oxides, and ferrous chloride;



(d) cooling the secondary gaseous stream from (c) above to a temperature below 675° C. sufficient to separate ferrous chloride as a solid from the product $TiCl_4$-containing secondary gaseous stream while maintaining the $TiCl_4$ in the vapor state;

(e) combining any ferrous chloride with or without ferric chloride obtained in step (b) with ferrous chloride obtained from step (d);

(f) converting solid ferrous chloride from step (e) above by partial oxidation with molecular oxygen at a temperature of 325° C. to 675° C. to Fe_2O_3 and $FeCl_3$ vapor and vaporizing any solid $FeCl_3$ from step (b) above if present;

(g) separating the $FeCl_3$ vapor from said Fe_2O_3;

(h) returing $FeCl_3$ obtained in step (g) together with any $FeCl_2$-free iron chloride obtained in step (b) to step (c) above; and

(i) combining the product $TiCl_4$ from the primary and secondary gaseous streams.

4,540,552

PROCESS FOR THE REMOVAL OF ACID GASES FROM A GAS MIXTURE

Bernard C. Ream, and Cyril Tellis, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 24, 1984, Ser. No. 613,456
Int. Cl.[3] C01B *17/16, 7/00*
U.S. Cl. 423—226 **10 Claims**

1. A process for the removal of acid gases which are reactive with ethylene oxide from a gas mixture containing carbon dioxide, comprising contacting the gas mixture with ethylene carbonate containing a sufficient amount of ethylene oxide, whereby the ethylene oxide reacts chemically with the acid gases to produce reaction products which are more easily removable from the gas mixture.

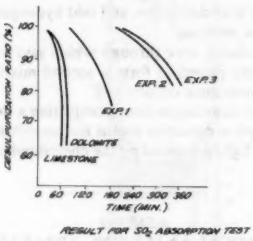
2. The process of claim 1, wherein the ethylene oxide is provided by the decomposition of the ethylene carbonate.

4,540,553

DESULFURIZING AGENT

Hiroshi Hagiwara, Urawa; Masaru Shirasaka, Tokyo, and Hajime Nagayama, Hino, all of Japan, assignors to Onoda Cement Co., Inc., Yamaguchi, Japan

Continuation of Ser. No. 535,697, Sep. 26, 1983, abandoned. This application Jan. 2, 1985, Ser. No. 688,273
Int. Cl.[3] B01D *53/34*
U.S. Cl. 423—230 **2 Claims**



RESULT FOR SO_2 ABSORPTION TEST

1. A desulfurizing method for removing at least one of H_2H and SO_2 from combustion exhaust gases comprising contacting said combustion exhaust gases with a desulfurizing heating agent in a fluidized bed, said heating agent comprising a hardened material of 0.7 to 2 mm in particle diameter prepared by mixing 10 to 70% by weight of cement with limestone or dolomite as the balance and hardening the resulting mixture by adding water.

4,540,554

REMOVAL OF SOX, NOX, AND PARTICULATE FROM COMBUSTED CARBONACEOUS FUELS

William R. Dayen, 810 Joan Terrace, Reading, Pa. 19611

Filed Jun. 5, 1984, Ser. No. 617,396
Int. Cl.[3] C01B *21/00;* **B01J** *8/00*
U.S. Cl. 423—235 **9 Claims**

1. The method of removing SOx, NOx and particulate from the combustion products stream of carbonaceous fuels, said method comprising the steps of:

(a) injecting dry potash of predetermined particle size into said combustion products stream in a region thereof having a first predetermined temperature in order to effect vaporization of the potassium compounds in the said potash to ionic form, said potassium compounds comprising predominately potassium chloride;

(b) permitting the preferential affinity reactions of said potassium ions with said SOx and NOx contained in the said combustion products stream to form potassium salts including at least potassium sulfate and potassium nitrate in the long and convoluted reaction zone afforded in the conventional and existing boiler equipment train;

(c) cooling of the said combustion products stream, potassium salts and excess potassium ions by conduction, convection and radiation to a second predetermined temperature afforded in the intentional design of the conventional and existing boiler equipment train, thereby effecting condensation of said potassium salts and said excess potassium ions as a coating of potassium oxide on flyash particles; and

(d) separating substantially off of said flyash particulate and potassium salts from the products of combustion.

4,540,555

METHOD OF REMOVING SULFUR DIOXIDE AND OTHER TOXIC AND NOXIOUS COMPONENTS FROM FLUE GASES

Paul W. U. Franke, Essen; Wolfgang Glaser, Frechen; Georg R. U. Gebhard, Reichshof, and Klaus R. G. Hein, Bergheim-Ahe, all of Fed. Rep. of Germany, assignors to Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Aug. 26, 1983, Ser. No. 526,903

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232077

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **5 Claims**

1. A method of removing sulfur dioxide from fly ash containing flue gas of a fossil fuel combustion, comprising the steps of:

(a) dry desulfurizing said flue gas by contacting same during said combustion with a finely divided particulate absorbent consisting essentially of calcium hydroxide, oxide or carbonate and thereafter separating dry solids, including said absorbent, reaction products of sulfur dioxide with said absorbent and fly ash from the flue gas;

(b) milling at least some of the dry solids separated from the flue gas in step (a)

(c) treating at least some of the dry solids separatd from the flue gas in step (a) with steam

(d) wet scrubbing at least part of said flue gas following the dry desulfrurization in step (a) with an aqueous scrubbing liquid containing water and a secondary absorbent, said secondary absorbent being at least part of the dry solids separated from the flue gas in step (a) and milled and treated in steps (b) and (c);

(e) introducing a previously unused quantity of said finely divided particulate absorbent into the scrubbing liquid in step (b) whereby a gypsum-containing sludge is formed in said scrubbing liguid upon collection thereof subsequent to wet scrubbing; and

(f) recovering a gypsum-containing sludge from said scrubbing liquid after the wet scrubbing in step (b) for use as a structural material.

4,540,556

DUAL ALKALI SCRUBBER LIQUOR REGENERATION WITH PRODUCTION OF GYPSUM

James H. Wilhelm, Sandy, Utah, assignor to Central Illinois Public Service Company, Springfield, Ill.

Continuation-in-part of Ser. No. 503,040, Jun. 10, 1983, Pat. No. 4,462,969. This application Jul. 30, 1984, Ser. No. 636,348

The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.

Int. Cl.³ C01B *17/00, 17/45, 17/62*

U.S. Cl. 423—242 **5 Claims**

1. The continuous process for regenerating spent sulfur dioxide gas scrubber bleed liquor that contains $NaHSO_3$ and Na_2SO_3, by reacting said bleed liquor with a calcium compound which process comprises the steps of providing said calcium as a calcium carbonate slurry formed from limestone, establishing and maintaining respectively in serially connected first and second reaction zones first and second sludge blankets each containing from about fifteen to about forty percent by weight solids overlain respectively by first and second supernatant liquor pools-containing less than about two percent by weight solids, subjecting said sludge blankets to gentle agitation to effect mixing of the sludge, continuously introducing said calcium carbonate slurry into an upper portion of said first sludge blanket below said first supernatant pool while continuously introducing into submergence in a lower portion of said first sludge blanket a stream of said scrubber bleed liquor, withdrawing supernatant liquor from said first supernatant pool and introducing it into submergence in the lower portion of said second sludge blanket, withdrawing sludge from said first sludge blanket and introducing the same into an upper portion of said second sludge blanket, retaining said sludge in said sludge blankets for a time sufficient to yeild therein reaction products that include calcium sulfite, withdrawing regenerated scrubbing liquid from said second supernatant pool and sludge from said second sludge blanket in amounts proportional respectively to the amounts of bleed liquor and limestone supplied to said reaction zones and subjecting said last named sludge to oxidation to convert the calcium sulfite therein to calcium sulfate.

4,540,557

PROCESS FOR REDUCING THE FLUORINE CONTENT IN WET-PROCESSED PHOSPHORIC ACID

Reinhard Gradl, Hürth, and Günther Schimmel, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,142

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328499

Int. Cl.³ C01B *25/16, 15/16, 25/26*

U.S. Cl. 423—321 R **6 Claims**

1. A process for producing phosphoric acid solutions from crude wet-processed phosphoric acid, containing fluorine ions, which process comprises extracting the said crude acid with an organic solvent; washing the organic phosphoric acid extract obtained with an aqueous aluminum hydroxide suspension containing at least 45 weight % aluminum hydroxide of which 99% consist of particles with a size of less than 1 μm, the balance consisting of particles with a size of less than 10 μm; reextracting the washed extract with water, with the resultant formation of the purified phosphoric acid having reduced fluorine content.

4,540,558

PROCESS FOR REMOVING ORGANIC CONTAMINANTS FROM WET-PROCESSED PHOSPHORIC ACID

Reinhard Gradl, Hürth; Hans-Werner Stephan, Cologne; Gero Heymer, and Günther Schimmel, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,456

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1983, 3325862

Int. Cl.³ C01B *23/16*

U.S. Cl. 423—321 R **4 Claims**

1. A process for removing organic compounds from crude wet-processed phosphoric acid comprising heating the acid to a temperature of at least 250° C. under a pressure of 15 to 85 bars, prior to contacting it with an adsorbant of active carbon or carbon black.

4,540,559

PREPARATION OF TYPE Y ZEOLITES

Bertrand Latourrette, Le Raincy, and Regis Poisson, Asnieres, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Aug. 22, 1983, Ser. No. 525,273

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 **13 Claims**

1. A process for the preparation of Type Y zeolite, comprising (i) intimately admixing, at essentially ambient temperature, an aqueous solution of a water-soluble aluminum compound with an aqueous solution of sodium silicate as to prepare a reaction mixture solution or sol therefrom, (ii) next heating said reaction mixture solution or sol to a temperature of crystallization, ranging from about 50 to 120° C., in less than about one minute, by heat exchange as to avoid any phase conversion thereof, but whereafter said reaction mixture solution or sol transforms essentially immediately into a gel, and (iii) thence maintaining the resulting gel at such crystallization temperature until type Y zeolite crystals are crystallized therefrom.

4,540,560

CARBON BLACKS

E. Webb Henderson, and Mark L. Gravley, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 413,202, Aug. 30, 1982,. This application Oct. 20, 1983, Ser. No. 543,684

Int. Cl.³ C01B *31/00, 31/02;* **C04B** *31/02*

U.S. Cl. 423—445 **2 Claims**

1. A carbon black characterized by a CTAB surface area of between about 70 and about 110 m^2/g, a 24M4DBP structure, of at least 92, a tint of less than about 99.8, and an aggregate size distribution breadth index G in the range of about 2.0 to about 2.6.

4,540,561

REMOVAL OF H_2S FROM GASEOUS STREAMS

Donald C. Olson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 24, 1984, Ser. No. 685,707

Int. Cl.³ B01D *53/34;* **C01B** *17/05*

U.S. Cl. 423—573 R **11 Claims**

1. A process for the removal of H_2S from a sour gaseous stream comprising contacting the sour gaseous stream, under conditions to convert H_2S, in a contacting zone with an aqueous reaction solution comprising an effective amount of iron-(III) lignosulfonate, and producing a sweet gas stream and an aqueous solution containing sulfur and iron(II) lignosulfonate.

4,540,562

PROCESS FOR THE PRODUCTION OF VANADYL HYDRATE

Harry E. Gardner, Grand Junction, Colo., assignor to Umetco Minerals Corporation, Danbury, Conn.

Continuation of Ser. No. 298,197, Aug. 31, 1981, abandoned, which is a continuation of Ser. No. 106,737, Dec. 26, 1979, abandoned. This application May 27, 1983, Ser. No. 498,710

Int. Cl.³ C01G *31/00;* **C22B** *34/22*

U.S. Cl. 423—592 **15 Claims**

1. A method for manufacture of vanadyl hydrate comprising the steps of:

(a) providing an aqueous solution of vanadate ion;

(b) adding sulfur dioxide and a non-oxidizing acid to said aqueous solution to reduce said vanadate ion to the vanadyl ion;

(c) solvent extracting said vanadyl ion from said aqueous solution with an organic solvent comprising di-2-ethyl hexyl phosphoric acid or hepta-decyl phosphoric acid;

(d) stripping said vanadyl ion from said organic solvent with ammonium hydroxide to form in three separate phases, an organic solution, an aqueous solution and a solid precipitate of vanadyl hydrate; and

(e) separating the solid vanadyl hydrate from said organic and aqueous solutions.

4,540,563

HYDROGEN PRODUCTION

Godfrey C. Chinchen, Cleveland, England, assignor to Imperial Chemical Industries PLC, United Kingdom

Division of Ser. No. 359,834, Mar. 19, 1982, abandoned. This application Mar. 14, 1984, Ser. No. 589,336

Claims priority, application United Kingdom, Mar. 26, 1981, 8109501

Int. Cl.³ C01B *2/10*

U.S. Cl. 423—656 **2 Claims**

1. A process of reacting carbon monoxide with steam to give carbon dioxide and hydrogen carried out over a catalyst consisting essentially of iron oxide and at least one further oxide that is at least as difficult to reduce to metal as divalent chromium oxide, contains metal exerting a valency of at least 2 and is incapable of forming a mixed oxide having the spinel structure $M^{II}M^{III}_2O_4$, where M^{II} is a divalent metal and M^{III} is a trivalent metal, wherein said further oxide is selected from the group consisting of calcium, strontium and barium and is present in an amount between 8–25% calculated as equivalent CaO, the content of spinel-forming oxide other than iron oxide being less than 1% w/w, the catalyst having the following properties:

Surface area m^2g^{-1}: 50–100
Helium density g cm^{-3}: 3.0–4.0
Mercury density g cm^{-3}: 1.4–1.8
Pore volume cm^3g^{-1}: 0.2–0.5
Mean pore radium nm: 6–10.

4,540,564

BRAIN-SPECIFIC DRUG DELIVERY

Nicholas S. Bodor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 379,316, May 18, 1982, Pat. No. 4,479,932, Ser. No. 461,543, Jan. 27, 1983, , and Ser. No. 475,493, Mar. 15, 1983, , said Ser. No. 461,543, and Ser. No. 475,493, each is a continuation-in-part of Ser. No. 379,316, . This application Jul. 22, 1983, Ser. No. 516,382

Claims priority, application PCT Int'l Appl., May 12, 1983, WO83/00725; Canada, May 16, 1983, 428192

Int. Cl.³ A61K *49/00, 31/58;* **C07J** *17/00*

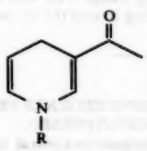
U.S. Cl. 424—9 **86 Claims**

1. A compound adapted for the site-specific/sustained delivery of a centrally acting drug species to the brain, said compound being:

(a) a compound of the formula

[D-DHC] (I)

wherein [D] is a centrally acting drug species, and [DHC] is the reduced, biooxidizable, blood-brain barrier penetrating lipoidal form of a dihydropyridine ⇄ pyridinium salt redox carrier, with the proviso that when [DHC] is



wherein R is lower alkyl or benzyl and [D] is a drug species containing a single NH_2 or OH functional group, the single OH group when present being a primary or secondary OH group, said drug species being linked directly through said NH_2 or OH functional group to the carbonyl function of [DHC], then [D] must be other than a sympathetic stimulant, steroid sex hormone or long chain alkanol; or

(b) a non-toxic pharmaceutically acceptable salt of a compound of formula (I) wherein [D] is a centrally acting drug species and [DHC] is the reduced, biooxidizable, blood-brain barrier penetrating lipoidal form of a dihydropyridine ⇄ pyridinium salt redox carrier.

12. A compound according to claim 1, wherein [D] is a steroid residue.

4,540,565

REDUCED IGG IN LOW IONIC STRENGTH MEDIUM FOR IMMUNOHEMATOLOGIC AGGLUTINATION

Daniel P. Roman, Jr., and Mitchell J. Fruitstone, both of Miami, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 13, 1981, Ser. No. 292,602

Int. Cl.³ G01N *33/50, 33/80*

U.S. Cl. 424—11 **29 Claims**

1. An antiserum for immunohematologic agglutination reactions comprising an erythrocyte-agglutinating amount of a

chemically reduced IgG antibody dissolved in a low ionic strength medium containing sufficient salt of an alkali or alkaline earth metal to provide an ionic strength equivalent to about a 0.01 molar to about a 0.10 molar solution of sodium chloride; sufficient organic solute to provide an osmolality of from about 150 mOsm per kg. H_2O, to about 450 mOsm per kg. H_2O and a pH of from about 6.0 to about 8.0.

29. A method of using antiserum of claim 1, comprising combining said antiserum with a patient's erythrocytes under erythrocyte-agglutinating conditions and determining whether or not said erythrocytes agglutinate.

4,540,566

PROLONGED RELEASE DRUG DOSAGE FORMS BASED ON MODIFIED LOW VISCOSITY GRADE HYDROXYPROPYLMETHYLCELLULOSE

Stanley S. Davis, Nottingham, England, and Norman G. Gaylord, New Providence, N.J., assignors to Forest Laboratories, Inc., New York, N.Y.

Filed Apr. 2, 1984, Ser. No. 596,095

Int. Cl.³ A61K *9/22, 9/26*

U.S. Cl. 424—22 **9 Claims**

1. A carrier base material combined with a therapeutically active medicament and shaped and compressed to a solid unit dosage form having a controlled and prolonged release pattern upon administration, the carrier base material being a mixture of one or more water-soluble nonionic cellulose ethers and an anionic surfactant, and wherein at least one of the cellulose ethers is a modified hydroxypropylmethylcellulose having a number average molecular weight of less than 50,000 and has been modified by successive or concurrent exposure to moisture and air.

4,540,567

COSMETIC COMPOSITION

Francis E. J. Oneto, Clichy-sous-Bois, and Marc Vermersch, Val d'Oise, both of France, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 842,017, Oct. 14, 1977, abandoned. This application Sep. 17, 1979, Ser. No. 76,525

Claims priority, application United Kingdom, Oct. 15, 1976, 42915/76

Int. Cl.³ A61K *31/22*

U.S. Cl. 424—45 **9 Claims**

1. A cosmetically acceptable composition for treating acne comprising

(a) from about 2% to about 50% by weight of a C_1–C_4 alkyl lactate;

(b) from about 5% to about 50% by weight of water; and

(c) from about 1% to about 80% by weight of a water-miscible C_2–C_4 alkylene glycol or a polymer thereof,

the composition having a pH value of from 4 to 7.

4,540,568

INJECTIONABLE VISCOELASTIC OPHTHALMIC GEL

Seymour F. Trager, 14 Sherwood Dr., Plainview, N.Y. 11803, and Victoria S. Chylinski, 11 Peghouse Rise, Slad Rd., Stroud, Glos., England

Continuation-in-part of Ser. No. 434,412, Oct. 14, 1982, abandoned. This application Jun. 27, 1984, Ser. No. 625,249

Int. Cl.³ A61K *31/78*

U.S. Cl. 424—81 **6 Claims**

1. An injectionable viscoelastic gel particularly adapted for use in ophthalmic surgical procedures and treatments which gel consisting essentially of from about 2 to about 5 percent by weight of a polymer selected from polyacrylamide and polymethacrylamide, said polymer having a molecular weight of from about 1 to about 6 million; from about 0.4 to about 8.6 percent by weight sodium chloride, from about 0.075 to about 0.3 percent by weight postassium chloride, from about 0.04 to about 0.33 percent by weight calcium chloride, from about 0.02 to about 0.04 percent by weight magnesium chloride hexahydrate, from about 0.3 to about 0.4 percent by weight sodium acetate, from about 0.15 to about 0.20 percent by weight of a buffer, remainder water.

4,540,569

METHOD FOR TREATMENT OF ALLERGIC DISORDERS AND IMMUNE COMPLEX DISEASES

Haruo Ohnishi, Funabashi; Hiroshi Kosuzume, Yokohama; Yasuo Suzuki, Kawaguchi, and Ei Mochida, Toshima, all of Japan, assignors to Mochida Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 345,152, Feb. 2, 1982, abandoned. This application Apr. 5, 1982, Ser. No. 365,465

Claims priority, application Japan, Feb. 10, 1981, 56-18429; Jun. 4, 1981, 56-86147; Jul. 18, 1981, 56-112856

Int. Cl.³ A61K *37/48*

U.S. Cl. 424—94 **22 Claims**

1. A method for treating patients suffering from allergic disorders or immune complex diseases, comprising administering an allergic disorder or immune complex disease treating effective amount of a human urinary acid protease to a patient suffering from such a disorder.

4,540,570

SYNERGISTIC PRESERVATIVE COMPOSITIONS

Gayle E. Borovian, Dover, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 576,286, Feb. 2, 1984, Pat. No. 4,499,071, which is a division of Ser. No. 378,372, May 14, 1982. This application Oct. 29, 1984, Ser. No. 666,023

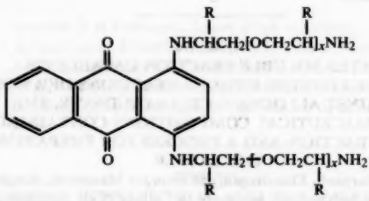
Int. Cl.³ A01N *33/02, 37/00*; A61K *31/74*

U.S. Cl. 424—78 **32 Claims**

1. A preservative comprising:

(a) a first component comprising benzoic acid; and

(b) a second component having the following formula:



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wherein x is about 2 to 33 and R is H or CH_3 and mixtures thereof; and

wherein the weight ratio of said second component to said first component is 1000:1 to 1:10, the combination acting to kill or inhibit the growth of bacteria.

4,540,571

COSMETIC AGENT CONTAINING NATURAL YEAST CELL CONTENTS

Dieter Schimanski, Herzogenrath, Fed. Rep. of Germany, assignor to Dr. Babor GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,093

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1981, 3139093

Int. Cl.³ A61K *31/78, 35/78*

U.S. Cl. 424—81 **6 Claims**

1. A cosmetic agent suitable for application to the skin comprising the usual basic cosmetic substances, and natural extract of yeast cell contents obtained by destroying yeast cell walls and breaking open yeast cells, the resulting natural extract of yeast cell contents being free of yeast cell walls in an amount in the range of 2 to 20 wt. % for the extract of yeast cells based upon the total weight of the cosmetic agent.

4,540,572

GEL-LIKE OINTMENT CONTAINING INDOMETACIN

Pyare Seth, Aesch, Switzerland, assignor to Mepha AG, Aesch, Switzerland

Filed Dec. 29, 1983, Ser. No. 566,578

Claims priority, application Switzerland, Aug. 29, 1983, 4726/83

Int. Cl.[3] A61K *31/40, 31/736*

U.S. Cl. 424—81 1 Claim

1. A product containing indomethacin, which is in the form of a gel-like ointment for the topical treatment of inflammation and which contains for 1.0 part by weight of indomethacin, 0.5 to 2.0 parts by weight of a water-soluble cellulose other or/and of a polyacrylic acid, the carboxyl groups of which are neutralized by a water-soluble amine in a greater than stoichiometric ratio to said carboxyl groups, 30 to 50 parts by weight of ethanol or isopropanol, 1.0 to 5.0 by weight of a superfatting agent, and water to complete 100 parts by weight, said product being essentially free of any glycol or polyalkylene glycol.

4,540,573

UNDENATURED VIRUS-FREE BIOLOGICALLY ACTIVE PROTEIN DERIVATIVES

Alexander R. Neurath, New York, and Bernard Horowitz, New Rochelle, both of N.Y., assignors to New York Blood Center, Inc., New York, N.Y.

Filed Jul. 14, 1983, Ser. No. 514,375

Int. Cl.[3] A61K *39/00, 35/14, 37/00;* C07G *7/00;* C07C *103/52*

U.S. Cl. 424—85 34 Claims

1. A process for rendering a blood product which comprises a labile blood protein substantially free of lipid-containing viruses without incurring substantial protein denaturation which comprises contacting said blood product with an effective amount of a di- or trialkylphosphate for a period of time sufficient to render said blood product substantially free of lipid-containing viruses without incurring substantial protein denaturation.

4,540,574

WATER SOLUBLE FRACTION CAPABLE OF CONTROLLING THE IMMUNE REACTIONS OF A HOST AGAINST ALLOGENIC CELLS OR TISSUE, THE PHARMACEUTICAL COMPOSITIONS CONTAINING SAID FRACTION AND A PROCESS FOR PREPARING THE LATTER

Walter Pierpaoli, Ebmatingen, and Georges Maestroni, Benglen, both of Switzerland, assignors to Cellena (Cell Engineering) A.G., Bmatingen, Switzerland and Choay S.A., Paris, France

PCT No. PCT/EP80/00136, § 371 Date Jul. 2, 1981, § 102(e) Date Jul. 2, 1981, PCT Pub. No. WO81/01367, PCT Pub. Date May 28, 1981

PCT Filed Nov. 21, 1980, Ser. No. 279,994

Int. Cl.[3] A61K *35/28*

U.S. Cl. 424—95 35 Claims

1. A water-soluble biologically active extract of bone marrow wherein said extract is identified by being substantially free of components having a molecular weight lower than that at least about 30,000; possessing an ultra-violet spectra having a peak of absorption at 280 mu; is capable of stimulating incorporation of H-thymidin bone marrow cells in vitro and in vivo; is capable of being lyophilized, and is capable of being deactivated by heating at about 70° C. for about thirty minutes, whereby said extract is capable of exhibiting biological activity in the form of a solution having a pH of at least 7 and controlling the immune reactions of a host against allogenic cells or tissue.

23. A process for the preparation of water-soluble biologically active extract from bone marrow capable of controlling the immune reactants of a host against allogenic cells or tissue, which comprises the steps of:

(a) collecting physiological inter-cellular medium from bone marrow cells;

(b) filtering and separating from said inter-cellular medium components having a molecular weight lower than at least about 30,000; and

(c) recovering the biologically active portion free from said components having a molecular weight below at least about 30,000;

said medium being maintained at a pH of at least about 7.0.

4,540,575

CHOLINE OXIDASE INHIBITOR

Richard L. Monaghan, Somerset, and Yu-Lin Kong, Edison, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 6, 1983, Ser. No. 492,272

Int. Cl.[3] A61K *35/74;* C12P *1/06*

U.S. Cl. 424—115 6 Claims

1. Product with choline oxidase inhibitory activity produced by the controlled aerobic fermentation of an aqueous nutrient medium by *Streptomyces hygroscopicus* ATCC 39296 at a temperature range of 20°–37° C. for 3–5 days at pH 6.0 to 8.0.

4,540,576

NEUTRAL TOPICAL SODIUM FLUORIDE GEL

Robert T. Zahradnik, Waltham, Mass., assignor to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Continuation-in-part of Ser. No. 404,263, Aug. 2, 1982, abandoned. This application Jan. 24, 1984, Ser. No. 573,530

Int. Cl.[3] A61K *7/18, 33/16*

U.S. Cl. 424—151 7 Claims

1. A thickened sodium fluoride aqueous composition suitable for use in the topical prophylactic treatment of the teeth, said composition consisting essentially of from about 75.2 to about 96.1 weight percent water, sodium fluoride in a proportion of from about 1 to about 5 weight percent of the total composition, and thickener, wherein the pH of the composition is within the range of from about 6 to about 8, and wherein the thickener consists essentially of xanthan gum and a water soluble salt of an acylic acid polymer.

4,540,577

DYNAMATE II MINERAL NUTRITION SUPPLEMENT

Richard B. Hunt, Vernon Hills, Ill.; William B. Dancy, and James B. Alexander, both of Carlsbad, N. Mex., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jul. 21, 1983, Ser. No. 515,730

Int. Cl.[3] A61K *33/14, 33/06, 33/04, 9/00*

U.S. Cl. 424—153 3 Claims

1. A nutritional mineral supplement for animal feeds comprising amorphous sulfur, potassium chloride and langbeinite prepared by the process consisting essentially of the steps of (a) forming a mixture of potassium chloride 0–13 parts and langbeinite 80–97% parts, (b) heating the mixture to above about 107° C., (c) slowly adding with agitation from about 3–7 parts of amorphous sulfur and (d) cooling the resulting mixture.

4,540,578

PESTICIDAL PHENOXYPYRIDYL BENZOYL UREAS

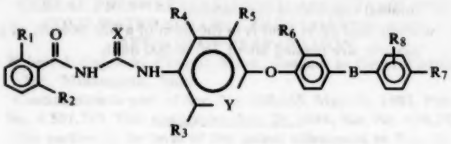
David T. Chou; John A. Durden, both of Raleigh, and Themistocles D. J. D'Silva, Chapel Hill, all of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1982, Ser. No. 454,849

Int. Cl.[3] C07D *213/64;* A01N *43/40*

U.S. Cl. 514—349 8 Claims

1.



wherein

X is oxygen or sulfur;

Y is nitrogen

B is sulfur, sulfinyl, sulfonyl;

R_1 & R_2 are independently hydrogen, halogen, methoxy, alkyl (C_1–C_4) or trifluoromethyl;

R_3, R_4, R_5 are independently hydrogen, methoxy, halogen, alkyl (C_1–C_4) or trifluoromethyl;

R_6 is hydrogen, halogen, alkyl (C_1–C_4) or trifluoromethyl;

R_7, R_8 are independently hydrogen, halogen, alkyl (C_1–C_4), trifluoromethyl, alkylthio (C_1–C_4), alkylsulfinyl (C_1–C_4), alkylsulfonyl (C_1–C_4), or R_7 R_8 can optionally be a substituted arylthio, a substituted arylsulfonyl, or a substituted arylsulfinyl, wherein said optional substituents are alkyl (C_1–C_4) or halogen.

6. A method of controlling insects and acarids which comprises subjecting said pests to a pesticidally effective amount of the composition of claim 1.

4,540,579

2-[(R) AMINO ACID ALKYL]PENEMS

Adriano Afonso, West Caldwell, and Jay Weinstein, Upper Montclair, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

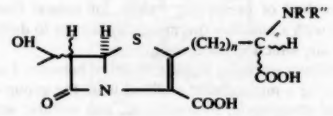
Filed Nov. 16, 1982, Ser. No. 441,988

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

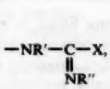
Int. Cl.³ C07D *499/00*; A61K *31/425*

U.S. Cl. 514—195 **18 Claims**

1. A compound represented by the formula



wherein R′ and R″ are independently hydrogen, lower alkyl, lower alkenyl, phenyl, substituted phenyl wherein the substituents are one or more groups chosen from among chloro, bromo, fluoro, lower alkyl, hydroxy, nitro, amino, aminomethyl, lower monoalkylamino, lower dialkylamino, lower alkoxy and carboxy, heteroaryl of 5 to 7 ring atoms of which 3 to 6 are carbon atoms and the remaining ring atoms are nitrogen, sulfur or oxygen, or R′is hydrogen and R″ is $CH_3(CH_2)_pCO$— or $CH_3(CH_2)_qSO_2$—, wherein p is 0–16 and q is 1–17, or R′, R″ and the N to which they are attached form a group of the formula



wherein

X is hydrogen, lower alkyl or amino;

n is 0 to 4; and

the pharmaceutically acceptable salts thereof, in racemic or optically active form.

4,540,580

2-[(1′R)-1′-AMINOALKYL]PENEMS

Adriano Afonso, West Caldwell, and Jay Weinstein, Upper Montclair, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

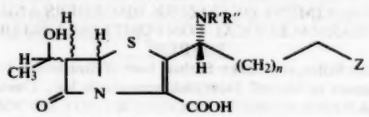
Filed Nov. 16, 1982, Ser. No. 441,989

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.³ C07D *499/00*; A61K *31/425*

U.S. Cl. 514—195 **29 Claims**

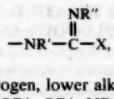
1. A compound of the formula



wherein

n is 0–4;

R′ and R″ are indpendently hydrogen, lower alkyl, lower alkenyl, phenyl, substituted phenyl, wherein the substituents are one or more groups selected from chloro, bromo, fluoro, lower alkyl, hydroxy, nitro, amino, aminomethyl, lower monoalkylamino, lower dialkylamino, lower alkoxy and carboxy, or heteroaryl of 5 to 7 ring atoms of which 3 to 6 are carbon atoms and the remaining ring atoms are nitrogen, sulfur or oxygen, or R′ is hydrogen and R″ is $CH_3(CH_2)_pCO$— or $CH_3(CH_2)_qSO_2$—, wherein p is 0–16 and q is 1–17, or R′, R″ and the N to which they are attached form a group of the formula



wherein X is hydrogen, lower alkyl or amino;

Z is hydrogen, COOR′, OR′, NR′R″, SR′, 4-imidazolyl, 3-indolyl, phenyl, p-hydroxyphenyl or branched lower alkyl, and the pharmaceutically acceptable salts and metabolizable esters thereof, in racemic or optically active form.

4,540,581

TOPICAL NONSTEROIDAL ANTI-INFLAMMATORY COMPOSITIONS AND USES

Xina Nair, East Amherst, N.Y., and Davis L. Temple, Jr., Evansville, Ind., assignors to Bristol-Myers Company, New York, N.Y.

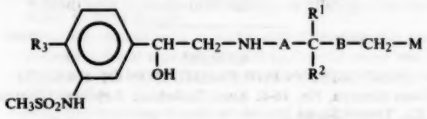
Filed Jan. 31, 1984, Ser. No. 575,418

Int. Cl.³ A61K *31/18, 31/24, 31/40, 31/235*

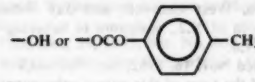
U.S. Cl. 514—415 **9 Claims**

1. A method of reducing topical inflammation in a mammal in need thereof which comprises topically administering to said mammal an amount effective to produce a topical anti-inflammatory effect of a composition comprising

(a) a compound of the formula



wherein R^1 and R^2 are independently hydrogen or (lower-)alkyl, provided that R^1 and R^2 cannot both be hydrogen; wherein M is phenyl, indole or hydrogen; wherein A is $(—CH_2—)_n$ in which n is 0, 1 or 2; wherein B is $(—CH_2—)_m$ in which m is 0, 1 or 2; and wherein R^3 is



and

(b) a compatible, topically acceptable vehicle.

4,540,582

TREATMENT OF SEIZURE DISORDERS AND PHARMACEUTICAL COMPOSITIONS USEFUL THEREIN

Nikolaus Seiler, and Shakir Sarhan, both of Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Mar. 28, 1984, Ser. No. 594,079

Claims priority, application United Kingdom, Apr. 29, 1983, 8311804

Int. Cl.³ A61K *31/195*

U.S. Cl. 514—561 **10 Claims**

1. A method for controlling seizures in a patient in need thereof which comprises administering to said patient in combination:

(a) from 0.2 to 2.0 grams per day of gamma-vinyl GABA, or a pharmaceutically acceptable salt thereof; and

(b) from 2 to 12 grams per day of glycine, sarcosine N,N-dimethylglycine or a pharmaceutically acceptable salt thereof.

4,540,583

METHOD OF TREATING TUMORS IN WARM-BLOODED ANIMALS

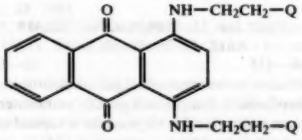
Keith C. Murdock, Pearl River, N.Y., and Frederick E. Durr, Ridgewood, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 63,290, Aug. 2, 1979, abandoned, which is a continuation of Ser. No. 873,174, Jan. 30, 1978, abandoned. This application Dec. 8, 1980, Ser. No. 214,147

Int. Cl.³ H61K *31/135*

U.S. Cl. 514—656 **1 Claim**

1. The method of inducing regression of leukemia and/or inhibiting growth of tumors in a mammal comprising administering to said mammal an effective antineoplastic amount of a compound selected from the group consisting of those of the formula:



wherein Q is amino, methylamino, ethylamino, dimethylamino, or diethylamino, the leuco bases and tautomers thereof, and the pharmacologically acceptable acid-addition salts thereof.

4,540,584

COMPOSITION FOR PROMOTION OF HEALTH

Nobuo Someya, No. 16-6, Kami-Ikebukuro 3-chome, Toshima-Ku, Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,456

Claims priority, application Japan, Dec. 28, 1982, 57-233889

Int. Cl.³ A61K *33/08, 33/04, 33/22, 33/32*

U.S. Cl. 424—156 **20 Claims**

1. A mineral supplement, comprising:

coral sand as an effective component in an amount sufficient to provide calcium carbonate and other minerals as a mineral supplement for humans;

wherein said coral sand is in the form of a fine powder of a particle size passing about 150 to 500 mesh.

4,540,585

FOOD PRODUCTS CONTAINING α-AMYLASE AND PROCESS

Ronald D. Priegnitz, Algonquin, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 262,252, May 11, 1981, abandoned. This application Jul. 27, 1983, Ser. No. 517,878

Int. Cl.³ A21D *13/06;* **A23K** *1/00;* **A23L** *3/34*

U.S. Cl. 426—28 **5 Claims**

1. In a soft, semi-moist pet food product consisting of soft, cohesive, extrusion cooked particles having 10–60% starch, 22–50% protein, 5–35% water soluble solutes, and 15–40% moisture; the improvement comprising:

an enzyme in the pet food product consisting essentially of alpha-amylase, wherein the alpha-amylase is in an active condition and wherein the active condition alpha-amylase is in the pet food in sufficient quantity to maintain the soft texture of the pet food product during subsequent storage.

4,540,586

METHOD OF PRESERVING FODDERS WITH A NUTRITIVE COATING

William P. Moore, P.O. Box 943, Hopewell, Va. 23860

Filed Jul. 1, 1983, Ser. No. 509,915

Int. Cl.³ A23L *3/00*

U.S. Cl. 426—69 **2 Claims**

1. A method of preserving fodder for animal feeding by coating it with a nutritive thermosetting barrier to dusts, moisture, and air, which method comprises:

(a) acidifying a coating liquid to a pH of between 1 and 3 by admixing a mineral acid selected from the group consisting of phosphoric, hydrochloric, and sulfuric acids, the coating fluid comprising between 20 and 40 percent urea-formaldehyde resin monomer, containing between 1.3 and 1.6 mols of formaldehyde per mol of urea and between 60 and 75 percent total solids, and having a viscosity of between 75 and 300 centipoise at 16° C., and between 60 and 80 percent nutritive cross-linking agent comprising cane molasses containing between 48 and 70 percent total sugars;

(b) holding the acidified coating liquid for a period of between 15 and 60 seconds to allow acid catalyzed polymerization and cross-linking of the monomer and cross-linking agent to start;

(c) applying the coating liquid to exposed surfaces of the fodder in a thickness between about 0.3 and 1.2 centimeters before it solidifies, covering enough of the exposed surface to substantially prevent the penetration of the fodder by the elements;

(d) maintaining pH of the coating liquid on the fodder surface between about 1 and 4 for a minimum time of about 10 minutes until the coating liquid has polymerized and cross-linked sufficiently to form a water insoluble solid barrier on the fodder surface.

4,540,587

CEREAL PRESWEETENED WITH ASPARTAME AND COLD WATER SOLUBLE GUM COATING AND METHOD OF PREPARATION

Robert J. Gajewski, Crystal, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 380,655, May 21, 1982, Pat. No. 4,501,759. This application Jun. 29, 1984, Ser. No. 626,252
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.
Int. Cl.[3] A23L *1/164*
U.S. Cl. 426—96 9 Claims

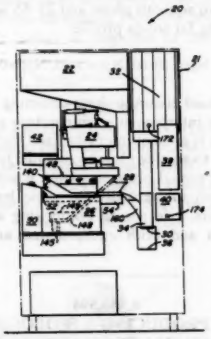
1. A sweetened, dry comestible consisting essentially of:
a dry comestible, said comestible having a coating, said coating comprising
from about 0.05% to 1.5% by weight of the comestible of a water soluble member selected from the group consisting of sodium alginates, propylene glycol alginates, guar gum, locust bean gum, gum Arabic, pectin, kappa carrageenan, methylcellulose, hydroxypropyl methylcellulose, xanthan, and mixtures thereof, and
about 0.05% to 0.3% by weight aspartyl-phenylalanine methyl ester, and
wherein the coating is present at from about 0.1% to about 1.8% of the coated comestible.

4,540,588

APPARATUS AND METHOD FOR DISPENSING INDIVIDUAL ORDERS OF A HOT FOOD PRODUCT AND COMPONENTS USABLE THEREWITH

William Bartfield, Sherman Oaks, Calif., assignor to Prize Frize, Inc., Sherman Oaks, Calif.

Division of Ser. No. 352,579, Feb. 26, 1982, Pat. No. 4,438,683. This application Mar. 26, 1984, Ser. No. 593,584
Int. Cl.[3] G01N *33/00;* A47J *37/12*
U.S. Cl. 426—231 15 Claims



1. A method of dispensing individual orders of a cooked food product using an apparatus contained in a housing, said method comprising:
supplying to a mixing chamber a quantity of dehydrated food product corresponding in quantity to the size of an order to be dispensed;
adding sufficient liquid to the mixing chamber to rehydrate the dehydrated food product;
intermittently forcing a predetermined quantity of the rehydrated product out of an outlet of the mixing chamber;
intermittently severing a portion of the rehydrated product as it forced from the outlet of the mixing chamber;
positioning a tank of heated cooking liquid below the outlet of the mixing chamber for receiving the severed food product;
providing a conveyor belt having a first end and a second end;
positioning the first end portion of the conveyor belt within the tank and below the level of liquid in the tank prior to severing of the food product;
positioning the second end of the conveyor belt adjacent a dispensing chute positioned within said housing;
depositing the severed food product on the conveyor belt;
driving the conveyor belt in a direction conveying the severed food product into the tank below the level of the liquid;
heating the severed food product in the tank of heated cooking liquid; and
reversing the driving direction of the conveyor belt to carry cooked food products out of the cooking liquid so that an individual order of cooked food product is delivered to the dispensing chute.

4,540,589

PROCESS FOR PRODUCING FIBROUS SIMULATED SEA FOODS PACKAGED IN HERMETICALLY SEALED CONTAINERS

Kazuo Rachi, Shizuoka; Shouichi Kubota, Shimizu, and Isamu Sasaki, Koganei, all of Japan, assignors to Nippon Suisan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 511,082
Claims priority, application Japan, Jul. 8, 1982, 57-118856
Int. Cl.[3] A23L *1/325, 3/00*
U.S. Cl. 426—250 7 Claims

1. A process for producing fibrous simulated sea foods packaged in hermetically sealed containers, which consists essentially of kneading a minced fish meat without sugar to which meat sodium chloride has been added, molding the kneaded meat into the form of noodle-like strips, preparing fibrous fish meat by forming cuttings like the teeth of a comb on the noodle-like strips or cutting the noodle-like strips into the form of noodle-like filaments, subjecting the thus-cut fibrous fish meat to setting in the state of noodle-like strips or noodle-like filaments for a time sufficient to acquire a firm texture, sheafing and binding the fibrous fish meat by the use of a binder containing kneaded krill meat, said kneaded krill meat being used in an amount sufficient to enhance the taste and flavor of said fibrous simulated sea food, and, after coloring a part of the surface of the bound product according to necessity, heating to coagulate said product and then packaging the bound product in a heat-resistant container; heating the bound product under pressurization in said container, wherein the pH value of the contents of the container when said product is packaged therein is in the range of 6.0 to 6.7.

4,540,590

PROCESS FOR PRODUCING RAPID-COOKING PASTAS HAVING GOOD KEEPING QUALITY

Haruo Harada; Akira Fujiwara; Yoshio Hatanaka, and Hironori Iimura, all of Tokyo, Japan, assignors to Myojo Foods Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,246
Claims priority, application Japan, Oct. 31, 1983, 58-204457
Int. Cl.[3] A21D *2/00;* A23L *1/16*
U.S. Cl. 426—324 11 Claims

1. A process for preparing rapid-cooking pastas having good keeping quality, said process comprising the following steps:
kneading a mixture of wheat and a sufficient amount of water to form dough;
feeding the dough in a cylinder and extruding the same through a die at a pressure of 50 kg/cm^2 or more into an atmosphere having a degree of vacuum of not more than 650 mmHg;
cutting the resulting strands to desired lengths;
drying the strands until the moisture content is reduced to 26±4%;
placing the dried strands in heat-resistant packages;
sealing the packages; and
sterilizing the strands by heating them at a temperature between 70° and 95° C.

4,540,591

ROBUSTA COFFEE STEAMING, ROASTING AND BLENDING METHOD

Jamshed B. Dar, Robbinsville; Robert H. Bruckmann, East Windsor, and Elisabeth Kelly, Bellemead, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 439,967, Nov. 8, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 680,855

Int. Cl.³ A23F *5/02*

U.S. Cl. 426—388 **8 Claims**

1. A method of treating Robusta coffee beans which comprises:

(a) charging an elongated column vessel with green Robusta coffee beans wherein 50% to 75% of the volume of the vessel is occupied by the beans;

(b) introducing saturated steam into the top of said vessel at a pressure between 7 atmospheres and 10 atmospheres and at a temperature between 166° C. and 180° C. for from 10 min. to 15 min. while continuously venting said vessel at the exit end and at an exit pressure of between 1 psig and 5 psig;

(c) discharging the steamed Robusta beans from said vessel and;

(d) roasting said steamed Robusta beans.

4,540,592

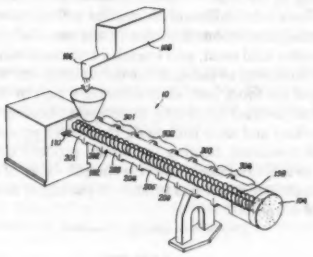
MULTIPLE SCREW PASTA MANUFACTURING PROCESS

William J. Myer, Prospect Heights, and Reid G. Lamppa, Streamwood, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Dec. 27, 1983, Ser. No. 566,589

Int. Cl.³ A23L *1/16*

U.S. Cl. 426—557 **9 Claims**



1. A method for preparing dense, homogeneous precooked pasta products which may be rapidly rehydrated in water comprising the steps of continuously combining pasta dough components comprising water and a dry cereal flour in a flighted, intermeshing, corotating twin screw compression zone to provide a pasta cereal dough mixture having a water content in the range of from about 25 to about 50 percent by weight of the total mixture;

conveying and forcing the pasta dough components through a first enclosed intermeshing, coratating twin screw pumping zone of increasing pressure and temperature, forcing said pasta components which have passed through said first zone back toward said first zone under conditions of intense mixing and shear to provide a first backmixing zone having a local pressure maximum, continuously withdrawing a uniformly mixed pasta dough from said first backmixing zone, conveying and forcing the uniformly mixed pasta dough which has passed through the first backmixing zone at elevated gelatinization temperature through a second enclosed intermeshing, corotating twin screw pumping zone of increasing pressure, forcing pasta dough components which have passed through said second pumping zone under conditions of intense mixing and shear to provide a second backmixing zone having local pressure maximum, whereby said cereal dough mixture is rapidly heated above the atmospheric gelatinization temperatures of starches in the cereal composition maintaining the cereal dough at an elevated temperature of 235° F. to about 350° F. under pressure within said first and second enclosed pumping zones while for a sufficient period of time in the range of from about 15 to about 100 seconds to fully gelatinize the starch component of the pasta composition;

conveying and forcing a fully gelatinized pasta dough from the second backmixing zone into a flighted, intermeshing corotating twin screw compression zone of increasing pressure and decreasing temperature wherein the fully gelatinized dough is cooled to a temperature in the range of from about 130? F. to below the boiling temperature of water to provide a pressurized, conditioned pasta extrusion dough, and

extruding the cooled, conditioned, fully gelatinized pasta extrusion dough at a pressure in the range of from about 400 psig to about 1000 psig through a die to form a dense, homogeneous fully gelatinized pasta product having an extruded pasta shape and continuously drying the shaped fully gelatinized pasta product at a temperature of at least about 130° F. to provide a dried, precooked pasta product which readily rehydrates in hot water.

4,540,593

REDUCED FAT SPREAD AND A PROCESS FOR THE PRODUCTION THEREOF

David P. J. Moran, Covington, and Iain J. Campbell, Wellingborough, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 7, 1983, Ser. No. 511,607

Claims priority, application United Kingdom, Jul. 8, 1982, 8219843

Int. Cl.³ A23D *3/00, 3/02*

U.S. Cl. 426—603 **21 Claims**

1. A process for producing a spread, comprising:

(a) producing an oil-in-water emulsion-cream containing 35–75% of an aqueous phase and 25–65 wt % of a fat with the following fat solids profile:

$$N_5 = 40\text{–}75,\ N_{15} = 20\text{–}60,\ N_{25} = 5\text{–}45,\ N_{35} = 0\text{–}10;$$

(b) subjecting said cream to shear-churning in the absence of an air/water interface at a temperature at which 5–50 wt % of the fat is present in crystallized form, to increase its viscosity up to a value close to or equal to the peak viscosity whereby partial phase inversion is achieved, to obtain a spread with substantially the same level of fat as the starting cream, said spread comprising a network of aggregated fat and both encapsulated and free aqueous phase.

4,540,594

METHOD OF PRODUCING A BIOLOGICALLY HIGH QUALITY NATURAL FOOD CONCENTRATE, THE PRODUCT OBTAINED AND ITS USE

Rudolf Schanze, Landsberger Str. 9, D-8034 Germering, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,133

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207505

Int. Cl.³ A23L *1/08, 1/30*

U.S. Cl. 426—74 **18 Claims**

1. A method of producing a biologically high grade, storage stable, fluid, natural food concentrate not requiring preservatives for storage stability comprising mixing

(a) honey or honey mixed with up to 50 weight percent of a bee product selected from the group consisting of drone jelly, royal jelly, propolis, propolis extract, pollen, beebread, beeswax and mixtures thereof in an amount such that the honey concentration in the concentrate is at least 40 weight percent;

(b) 5 to 25 weight percent mineral additive;

(c) 5 to 25 weight percent protein containing material having a biological value of more than 90 and a total proportion of essential amino acids of at least 50 weight percent; and
(d) 0 to 35 weight percent of a material selected from the group consisting of roughage and polymeric carbohydrate and mixtures thereof.

4,540,595

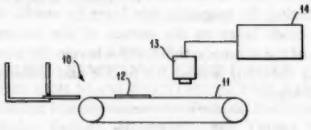
ARTICLE IDENTIFICATION MATERIAL AND METHOD AND APPARATUS FOR USING IT

Mario A. Acitelli; Richard F. Tynan, both of Charlotte, and Alan R. Wayson, Concord, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 344,667, Feb. 1, 1982, abandoned. This application Oct. 7, 1982, Ser. No. 433,311

Int. Cl.³ B41M *3/14;* **B44F** *1/12;* **B05C** *11/00*

U.S. Cl. 427—7 **10 Claims**



8. The method of automatically identifying objects comprising the steps of:
applying identifying intelligible markings to the objects using a material which, when applied to the object, fluoresces in response to radiation excitation to produce a radiation response principally in a spectrum of wave lengths between 650 and 800 mm,
subjecting the objects to exciting radiation that includes substantially no radiation in said spectrum,
reading said markings by selectively detecting only radiation in said spectrum emanating from the object, and
identifying the object in response to the reading of said markings.

4,540,596

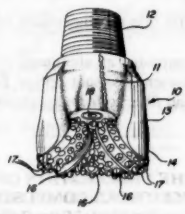
METHOD OF PRODUCING THIN, HARD COATING

Rao R. Nimmagadda, Fountain Valley, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 492,317, May 6, 1983, abandoned. This application Aug. 27, 1984, Ser. No. 644,488

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—37 **4 Claims**



1. A method of producing a thin, hard coating on selected surfaces of bearings, seal glands and cutting elements of rotary cone rock bit components by overlay coating said surfaces with an engineering ceramic comprised of at least one metallic element selected from a list consisting of Ti, Hf, Zr, Nb, Ta, W, B, Al, Co, and Cr, combined with at least one nonmetallic element selected from a list consisting of O, N, and C, by a modified physical vapor deposition process comprising the steps of:
cleaning said surfaces of said components of said rock bit chemically, said surfaces to be free of residue,
masking surfaces of said components which are to remain uncoated,
loading said components into a vacuum coating chamber,
locating at least one electric arc cathode metal vapor source spaced apart from said components in unobstructed view of said surfaces to be coated, said cathode is comprised of said metallic element, said cathode is cooperative with an anode,
reducing atmospheric pressure within said chamber to about 1×10^{-5} torr,
supplying a high voltage bias of from about 500 volts to about 5000 volts to said components, said bias being negative with respect to said cathode,
powering said vapor source to produce a first ionic plasma to further clean said surfaces and heat said components to a process temperature between about 200° Fahrenheit and about 400° Fahrenheit,
supplying selected said nonmetallic element to said chamber as a reactant gas in quantity sufficient to raise said pressure within said chamber to about 1×10^{-3} torr,
lowering said high voltage bias to between about 50 volts to about 500 volts to maintain said process temperature,
depositing said ceramic until a coating of between about 0.00005 inch and 0.001 inch thickness has been deposited,
stopping said deposition process,
raising pressure within said chamber to about one atmosphere, and
removing said components from said chamber.

4,540,597

PROCESS FOR PRODUCING OPTICAL FIBER FOR OPTICAL TRANSMISSION

Shoji Nagasaki; Keiichi Kojima, and Keiji Ueno, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 21, 1984, Ser. No. 673,639

Claims priority, application Japan, Nov. 22, 1983, 58-220218

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—44 **9 Claims**

1. A process for producing an optical fiber for optical transmission, which comprises forming a primary coating layer on a glass fiber, forming a secondary coating layer comprising a polyamide resin composition or polyester elastomer composition containing a polyfunctional monomer and a lead compound on the primary coating layer, and crosslinking the secondary coating layer by irradiation with electron rays having a maximum transmittance thickness smaller than the total thickness of the primary coating layer and the secondary coating layer.

4,540,598

PROCESS FOR CURING ACID-CURABLE FINISHES

Godwin Berner, Rheinfelden, and Werner Rutsch, Fribourg, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

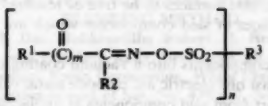
Filed Aug. 9, 1984, Ser. No. 639,040

Claims priority, application Switzerland, Aug. 17, 1983, 4484/83

Int. Cl.³ B05D *3/06;* **C08F** *2/50*

U.S. Cl. 427—54.1 **7 Claims**

1. A process for curing baking finishes which contain an acid-curable resin and, as a curing catalyst, a blocked sulfonic acid of the formula I



(I)

in which m is 0 or 1 and n is 1 or 2, R^1 is C_1–C_{12}-alkyl, C_1–C_4-halogenoalkyl, C_2–C_6-alkenyl, C_5–C_{12}-cycloalkyl, C_6–C_{10}-aryl which is unsubstituted or mono- or poly-substituted by halogen, C_1–C_{16}-alkyl, C_1–C_4-alkoxy, phenoxy, phenyl or nitro, furyl, thienyl, C_7–C_{12}-aralkyl, C_1–C_8-alkoxy, C_5–C_8-cycloalkoxy, phenoxy or H_2N—CO—NH—, R^2 is as defined for R^1 or is —CN, C_2–C_5-alkanoyl, benzoyl, C_2–C_5-alkoxycarbonyl, phenoxycarbonyl, —$N(R^4)(R^5)$, morpholino or piperidino, or R^1 and R^2, together with the atoms to which they are linked, form a 5-membered to 8-membered ring to which 1 to 2 benzo radicals can be fused, R^4 being hydrogen, C_1–C_{12}-alkyl, phenyl, C_2–C_9-alkanoyl or benzoyl and R^5 being hydrogen, C_1–C_{12}-alkyl or cyclohexyl, and R^3, with n = 1, is C_1–C_{18}-alkyl, C_6–C_{10}-aryl which is unsubstituted or mono- or poly-substituted by halogen, C_1–C_4-halogenoalkyl, C_1–C_{16}-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkyl-CONH-, phenyl-CONH-, benzoyl or nitro, C_5–C_{12}-cycloalkyl, C_7–C_9-aralkyl, camphoryl, —CF_3, —CCl_3 or —NH_2, and, with n = 2, R^3 is C_2–C_{12}-alkylene, or unsubstituted or C_1–C_{12}-alkyl-substituted phenylene, naphthylene, diphenylene or oxydiphenylene, which comprises irradiating the finish with short-wave light, whereby the free sulfonic acid is formed, and then fully curing it at an elevated temperature.

4,540,599

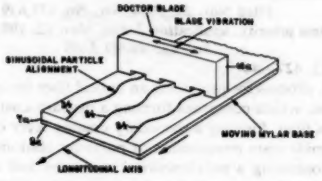
X-RAY IMAGE CONVERTER DEVICES UTILIZING RARE EARTH OXYHALIDE PHOSPHORS

Jacob G. Rabatin, Montville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 483,342, Apr. 8, 1983, Pat. No. 4,498,008. This application Oct. 9, 1984, Ser. No. 658,713

Int. Cl.³ G01J *1/58*

U.S. Cl. 427—65 **7 Claims**



1. A process for the preparation of a layer of rare earth oxyhalide phosphor crystals having a plate-like shape for use in an x-ray image converter device comprising the steps of:

(a) forming a liquid suspension containing said phosphor crystals and a binder, said phosphor crystals having the structural formula:

$$LnOX:T_x$$

wherein

Ln is one or more of La and Gd,

X is one or more of Cl and Br, and

T_x is an activator ion selected from Tb and Tm, including mixtures thereof,

(b) depositing said liquid suspension on a physical support with a first velocity gradient in the flow direction corresponding to the longitudinal axis of said phosphor layer and a second velocity gradient in the flow direction generally perpendicular to said longitudinal axis, and

(c) removing liquid from said deposited liquid suspension to form a solid phosphor coating adhesively bonded to said physical support.

4,540,600

PROCESS FOR PRODUCING A MAGNETIC RECORDING MEDIUM

Koji Kobayashi; Kiyoshi Noguchi, and Suguru Takayama, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,890

Claims priority, application Japan, Mar. 30, 1983, 58-54797

Int. Cl.³ H01F *10/02*

U.S. Cl. 427—130 **4 Claims**

1. A process for producing a magnetic recording medium which comprises forming on a non-magnetic substrate a magnetic thin layer composed of columnar crystal particles comprising Co, or Co and Ni and/or Cr by vapor-depositing the metal atoms at an angle of incidence of at least 20° C. relative to the normal line of the principal plane of the substrate, and then oxidizing the magnetic thin layer by anodic oxidation to form an oxide layer on the surface of the columnar crystal particles of the magnetic thin layer wherein the atomic ratio of O/(Co or Co+Ni) is from 0.1 to 0.5, and thereby to form a magnetic layer.

4,540,601

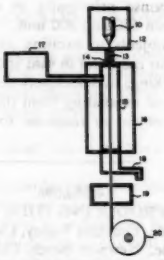
ALUMINUM OXIDE OPTICAL FIBER COATING

Dilip K. Nath, Framingham, Mass., assignor to Aetna Telecommunications Laboratories, Westborough, Mass.

Filed Jul. 31, 1984, Ser. No. 636,368

Int. Cl.³ G02B *5/14, 1/10*

U.S. Cl. 427—163 **18 Claims**



1. A process for providing a coated optical fiber comprising:

providing a glass preform of a type adapted to be drawn into an optical fiber;

drawing the preform into the dimensions of an optical fiber; and

pyrolytically decomposing an aluminum ester or derivative thereof in the presence of said optical fiber immediately after drawing said fiber to form an aluminum oxide coating thereon.

4,540,602

PROCESS FOR THE PREPARATION OF ACTIVATED PHARMACEUTICAL COMPOSITIONS

Shimesu Motoyama, Asaka; Satashi Sato; Seiichi Umeda; Huotsune Yasumi; Emiko Sudo; Yuko Takasaka, and Takuichi Tsujino, all of Tokyo, Japan, assignors to Freund Industry Company, Limited, Tokyo, Japan

Continuation of Ser. No. 139,750, Apr. 14, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 420,384

Claims priority, application Japan, Apr. 13, 1979, 54-44261; Jun. 16, 1979, 54-75774; Jun. 17, 1979, 54-76203

Int. Cl.³ B01J *13/02;* **A61K** *9/50*

U.S. Cl. 427—213.31 **10 Claims**

1. A process for the preparation of an activated pharmaceuti-

cal composition containing a solid drug in the form of finely divided particles substantially not greater than 10 microns in diameter, which comprises the steps of:

(1) providing a solid drug that is scarcely soluble in water and is soluble in a low-boiling hydrophobic organic solvent;

(2) dissolving the solid drug in said low-boiling hydrophobic organic solvent;

(3) emulsifying the resulting solution in water in the presence of a water-soluble, high-molecular weight substance selected from the group consisting of hydroxypropyl cellulose, methyl cellulose, hydroxyethyl cellulose, hydroxypropyl methyl cellulose, hydroxypropyl ethyl cellulose, carboxymethyl cellulose sodium salt, alpha-starch, hydroxypropyl starch, pullalan, gum arabic, tragacanth gum, gelatin, polyvinyl alcohol, polyvinyl pyrrolidone and mixtures thereof; and

(4) then removing the dispersion medium from the so-formed disperse system.

4,540,603

RESIN-MOLDED SEMICONDUCTOR DEVICE AND A PROCESS FOR MANUFACTURING THE SAME

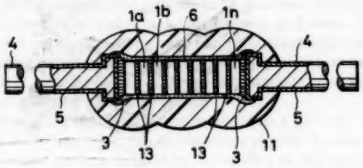
Toshiyuki Hidaka; Hisashi Sakamoto; Toshiaki Fukuhara, all of Hitachi; Sadao Fujieda, Haramachi, and Yutaka Misawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,039

Claims priority, application Japan, Dec. 20, 1982, 57-224483

Int. Cl.³ H01L *23/30*

U.S. Cl. 427—82 **4 Claims**



1. A process for manufacturing semiconductor devices comprising:

a step of horizontally holding a sub-assembly that consists of a semiconductor pellet brazed to a pair of axial leads, and of depositing an epoxy resin of a predetermined amount onto the semiconductor pellet while turning the sub-assembly with the axial leads as a center;

a step of heating the epoxy resin at a temperature of 160° to 180° C. for a period of 2 to 10 minutes while turning the sub-assembly, so that surface portions of the epoxy resin are hardened; and

a step of heating the epoxy resin at a temperature of 160° to 200° C. for a period of 3 to 25 hours while maintaining the sub-assembly stationary without turning it, so that the epoxy resin is completely hardened.

4,540,604

THICK FILM CONDUCTOR COMPOSITIONS

Vincent P. Siuta, Cherry Hill, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 526,400, Aug. 25, 1983, Pat. No. 4,514,321.

This application Jan. 10, 1985, Ser. No. 690,454

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—96 **2 Claims**

1. A method of making a thick film resistor comprising the sequential steps of:

1. applying to a ceramic substrate a patterned terminating layer of a thick film conductor composition comprising a mixture of finely divided particles of:

a. 85–98.8% wt. conductive material consisting essentially of 28–100% wt. copper and 72–0% wt. noble metal;

b. 10–1% wt. inorganic binder having a softening point below 800° C.; and

c. 5–0.2% wt. of a noncuprous material selected from the group consisting of tungsten, molybdenum, rhenium and alloys and mixtures thereof

dispersed in organic medium, the composition being further characterized in that:

(1) the copper particles have a maximum size below 10 μm and an average size of 2–4 μm; and

(2) the noncuprous metal particles have a maximum size below 5 μm and an average size of 0.2–3 μm.

2. firing the patterned conductor layer in a nonoxidizing atmosphere to effect volatilization of the organic medium, decomposition of the copper oxide and sintering of the inorganic binder;

3. applying to the substrate and the fired conductor layer a patterned layer of thick film resistor paste comprising an admixture of finely divided particles of resistance material and inorganic binder dispersed in organic medium; and

4. firing the patterned resistor layer in a nonoxidizing atmosphere to effect volatilization of the organic medium and sintering of the inorganic binder.

2. A method of making multilayer interconnection package comprising the sequential steps of:

1. applying to a ceramic substrate a patterned layer of a thick film conductor composition comprising a mixture of finely divided particles of:

a. 85–98.8% wt. conductive material consisting essentially of 28–100% wt. copper and 72–0% wt. noble metal;

b. 10–1% wt. inorganic binder having a softening point below 800° C.; and

c. 5–0.2% wt. of a noncuprous material selected from the group consisting of tungsten, molybdenum, rhenium and alloys and mixtures thereof

dispersed in organic medium, the composition being further characterized in that:

(1) the copper particles have a maximum size below 10 μm and an average size of 2–4 μm; and

(2) the noncuprous metal particles have a maximum size below 5 μm and an average size of 0.2–3 μm.

2. firing the patterned conductor layer in a nonoxidizing atmosphere to effect volatilization of the organic medium, decomposition of the copper oxide and sintering of the inorganic binder;

3. applying to the substrate and the fired conductor layer a patterned layer of thick film dielectric paste comprising an admixture of finely divided particles of dielectric solids and inorganic binder dispersed in organic medium, the patterned layer having vias communicating with the underlying conductive layer;

4. firing the patterned dielectric layer in a nonoxidizing atmosphere to effect volatization of the organic medium and sintering of the inorganic binder;

5. applying over the fired dielectric layer a patterned layer of, and filling the vias with, the conductor composition of claim **11**;

6. firing the patterned conductor layer and the filled vias in a nonoxidizing atmosphere to effect volatilization of the organic medium, decomposition of the copper oxide and sintering of the inorganic binder; and

7. repeating the sequence of steps 3 to 6.

4,540,605

METHODS FOR COATING ACOUSTICAL SURFACES

John A. Barone, 34 Winston Dr., Brentwood, N.Y. 11717

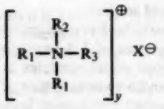
Filed May 29, 1984, Ser. No. 614,864

Int. Cl.³ B05D *5/00, 7/24*

U.S. Cl. 427—243 **7 Claims**

1. A method for coating an acoustical surface which contains pores adapted to receive soundwaves, without substantially clogging the pores and reducing the sound absorption

characteristics, which comprises applying to the surface of the acoustical material a coating composition comprising about 1.0 to 20.0 parts by volume of a pigment, about 0.08 to 0.8 parts by volume of a disinfectant, about 0.1 to 1.0 parts by volume of an air freshener, about 0.1 to 1.0 parts by volume of a quaternary ammonium compound of the following formula



wherein R_1 is an aliphatic hydrocarbon containing from 16 to 20 carbon atoms, R^2 is an alkyl group containing from 1 to 3 carbon atoms, and R_3 is selected from the group consisting of R_1 and R_2, X is an anion and y is the valency of X, these components being contained in about 50 to 200 parts by weight of water, and permitting the coating to dry.

4,540,606

METHOD OF FORMING A HEAT-BARRIER LAYER ON A METAL SUBSTRATE

Erich Fitzer, Karlsruhe; Karl Brennfleck, Karlsruhe-Grötzingen, and Jürgen Schlichting, deceased, late of Karlsruhe, all of Fed. Rep. of Germany (by Isabella Fischer, administrator), assignors to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 17, 1984, Ser. No. 631,585

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327216

Int. Cl.³ B05D *5/00*

U.S. Cl. 427—247 **9 Claims**

1. A method of forming a heat-barrier layer for a dense metal body, said method comprising forming a metal substrate of a porous metal felt, and effecting chemical vapor-phase deposition of zirconium dioxide as a heat-barrier layer by infiltration of finely granular zirconium dioxide in said metal felt in non-uniform distribution from one surface of said metal felt into the interior thereof towards the other surface of the metal felt, the metal substrate being affixable to a dense metal body by attaching said other surface of the infiltrated metal felt to the dense metal body.

4,540,607

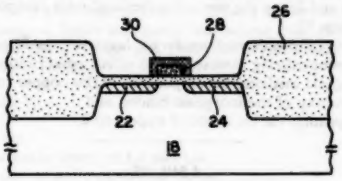
SELECTIVE LPCVD TUNGSTEN DEPOSITION BY THE SILICON REDUCTION METHOD

Kuey-Yeou Tsao, Barrington, Ill., assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Aug. 8, 1983, Ser. No. 521,500

Int. Cl.³ B05D *3/06;* **C23C** *11/00, 13/00*

U.S. Cl. 427—253 **9 Claims**



1. A method of treating polycrystalline and single crystalline silicon surfaces having nucleation sites thereon, comprising the step of:

preparing said surface by exposing said surface to an inert plasma to induce more uniform nucleation sites on said surface.

4. A method of treating surfaces as recited in claim **1**, further comprising the step of:

selectively depositing up to 1,000 angstroms of tungsten by chemical-vapor deposition on said surface according to the reaction

$$2WF_6+3Si \rightarrow 2W+3SiF_4$$

wherein a thin layer of said surface is consumed during deposition to produce SiF_4 and tungsten remains on said surface, said depositing step being performed after said preparing step.

4,540,608

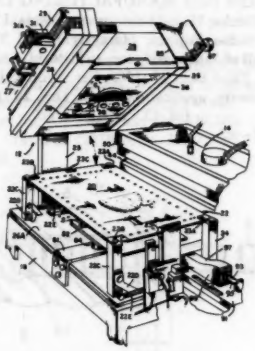
METHOD OF APPLYING A FUSIBLE POWDER

Robert C. Simmonds, Jr., Topsfield; Andrew J. Gilbride, Swampscott, and Albert I. Morse, Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Dec. 29, 1982, Ser. No. 452,962

Int. Cl.³ B05D *1/28*

U.S. Cl. 427—282 **11 Claims**



1. A method for reinforcing a shoe upper, comprising:

applying a reinforcing material onto a receiving surface through a shaped cut-out;

heating said reinforcing material on said receiving surface;

transferring said heated reinforcing material from said receiving surface to a shoe upper by applying a shoe upper thereagainst; and

cooling said upper during the application of pressure between said upper and said reinforcing material on said receiving surface.

4,540,609

METHOD FOR STRENGTHENING LONG CHAIN SYNTHETIC POLYMER FIBERS

Dennis B. Hill, Austin, Tex., assignor to Hill & Dunn Networks, Inc., Austin, Tex.

Filed Oct. 25, 1983, Ser. No. 545,677

Int. Cl.³ B05D *3/04, 3/10*

U.S. Cl. 427—343 **16 Claims**

1. A method for strengthening a synthetic fibrous material comprising the steps of:

soaking the material in an aqueous treatment solution of alum wherein the concentration of alum is from about 5 to 200 grams per liter of water;

rinsing the treated material in an aqueous solution; and

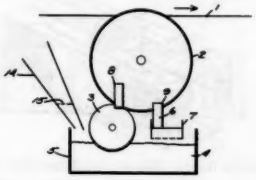
drying the treated material.

10. The method of claim **1** including the step of wetting the treated material with an aqueous fixing solution of a water soluble metallic carboxylate (R-COOR'), where R is an aliphatic chain and R' is an univalent metal.

4,540,610
HOT MELT SIZE APPLYING

Delano M. Conklin, Burlington; John B. Hodgin, and Walter F. Illman, both of Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Sep. 30, 1982, Ser. No. 430,004
Int. Cl.[3] B05D *1/18;* B65H *71/00*
U.S. Cl. 427—434.5 30 Claims



1. Apparatus for applying sizing material to a plurality of textile strands, comprising: an applicator cylinder having a grooved exterior circumferential surface and mounted for rotation about a first axis; means for applying melted sizing material to said cylinder so that size is lodged in said grooves thereof; means for rotating said cylinder about said first axis so that size in said grooves is applied to textile strands each moving past said cylinder and traveling for at least a short distance in a groove; means for cleaning the grooves in said grooved cylinder, comprising a pad having a plurality of integral projections formed thereon substantially identical to the grooves formed in said cylinder, said pad made of material having a capacity for continuous use at high temperature; and means for mounting said pad and holding said pad in contact with said cylinder during rotation thereof so that said projections on said pad enter said cylinder grooves, remaining stationary in said grooves and effecting cleaning thereof.

23. Apparatus for applying sizing material to a plurality of textile strands, comprising: an applicator cylinder having a peripheral closed surface defined by a plurality of alternating grooves and lands, said grooves and lands extending circumferentially about said peripheral closed surface; said lands peaking between said grooves and sloping from said peaks to grooves on either side thereof to aid in insuring proper feeding of each strand in a warp sheet into an individual groove in said application cylinder, each said land making an angle of about 8°-12° with respect to a plane bridging the entrance of a respective groove; said applicator cylinder rotatable about a first axis of rotation; means for applying sizing material to said applicator cylinder so that size is lodged in said grooves; and means for rotating said applicator cylinder about said first axis so that size in said grooves is applied to textile strands moving past said cylinders and traveling for at least a short distance in a said groove immersed in size in said groove so as to pick up size in that groove;

said means for applying the sizing material to said cylinder comprising: an open-top trough of melt; and a furnisher roll mounted for rotation about a second axis generally parallel to, but spaced from, said first axis; said furnisher roll comprising means for transferring size from said trough, filling the grooves in said applicator cylinder with size, and wiping said cylinder lands clean, and said furnisher roll having a preshaped circumferential surface portion having sloping areas which mate with lands of said applicator cylinder, and having flat areas which bridge entrances to grooves of said applicator cylinder when said roll and applicator cylinder are pressed together, said surface of said roll being of substantially rigid material.

28. A method of effecting cleaning of an applicator cylinder having a plurality of grooves therein extending circumferentially about the peripheral closed surface thereof with lands between said grooves, utilizing a pad of thermoplastic polymeric material comprising the steps of:

heating the pad and applicator cylinder;

while rotating the hot applicator cylinder, bringing the pad into contact therewith, under pressure, for a sufficient length of time for the pad surface to take the contour of the cylinder surface;

once the cylinder surface and pad surface mate, supplying molten size to said applicator cylinder grooves;

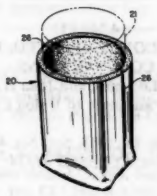
removing a portion of the size from said applicator cylinder grooves by passing spun yarn, or like textile strands, into operative association therewith; and

effecting mating of said cleaning pad and applicator cylinder at an area past the point where spun yarn or like textile strands remove molten size from said grooves to effect cleaning of said applicator cylinder.

4,540,611
FOLD-UP INSULATED BEVERAGE CONTAINER HOLDER

Scott R. Henderson, 5025 Eagle Pass, Plano, Tex. 75023

Filed Dec. 13, 1983, Ser. No. 561,042
Int. Cl.[3] B65D *23/08*
U.S. Cl. 428—12 9 Claims



1. A fold-up insulative beverage container holder with an open top comprising: a die cut sheet form of insulative material with, two opposite side substantially rectangular halves, a center bottom interconnecting said opposite side substantially rectangular halves and with the center bottom shaped to conform to the bottom of a cylindrical beverage container the holder is designed to hold; and with edges of said opposite side substantially rectangular halves fastened together by fastening means forming two generally vertically extended seams joining said halves together forming the utilitarian insulative holder with an open top for receiving cylindrical beverage containers; wherein said die cut sheet of insulative material is a one sided smooth plastic surface laminated sheet of insulative foam with a smooth vinyl surface and with the one sided smooth plastic surface of said die cut sheet form of insulative material to the outside of said insulative beverage container holder; and wherein said sheet form of insulative material and said vinyl laminated surface in the finished holder present a soft pliable holder collapse foldable to a flat storage state from which it is readily reopenable time-after-time for repeated cycles of storage, like in a pocket, and use reopened as an insulative beverage container holder.

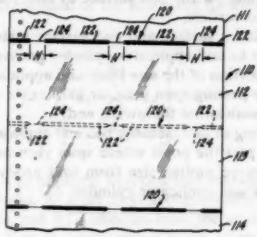
4,540,612
FOLDABLE SHEET PLASTIC PRODUCTS

Edison L. Rhyner, Chicago, Ill., assignor to Sealtran Corporation, Chicago, Ill.

Filed Aug. 5, 1981, Ser. No. 290,369
Int. Cl.[3] B32B *3/30*
U.S. Cl. 428—35 7 Claims

1. In an improved sheet plastic product of the kind comprising first and second panels of matched size and configuration formed from a single sheet of plastic material of nominal given thickness and having a fold line of predetermined depth D1, less than the thickness of the plastic sheet, cut into the plastic sheet at the juncture of the two panels to permit folding the

two panels together into parallel facing engagement with each other, the improvement comprising a fold line cut to the predetermined depth D1 throughout most of the juncture between the two panels and cut to a preselected depth D2 substantially less than D1 in the remaining minor fractional portion of the



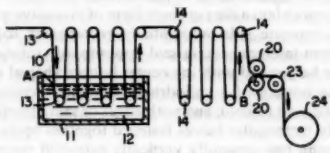
fold line length to assure retention of at least one alignment hinge between the panels when the panels are folded together into parallel facing relation, in which the depth D1 is about three-fourths of the thickness of the sheet plastic material and in which the depth D2 is about one-half of the thickness of the sheet plastic material.

4,540,613

TAR-DEPLETED, CONCENTRATED, LIQUID SMOKE COMPOSITIONS

Myron D. Nicholson, Lockport, and John H. Beckman, Downers Grove, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 14, 1983, Ser. No. 465,924
Int. Cl.³ B65D *81/34*
U.S. Cl. 428—36 **63 Claims**



1. A food casing having an absorptive index of at least 0.25 at a wavelength of 340 nm and containing a coating prepared by treating a casing surface with a tar-depleted concentrated liquid smoke composition having an absorptive power of at least about 0.15 at a wave length of 340 nm, a total acid content greater than about 12 and less that about 40 weight percent, and a carbonyl content greater than about 200 mg/ml, wherein said tar-depleted concentrated liquid smoke composition is derived from a substantially unneutralized tar-depleted liquid smoke fraction having a light transmittance of at least 50%.

4,540,614

BUNDLE OF PAPER SHEETS OR THE LIKE

Shozo Omori, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha and Omori Machine, both of, Japan

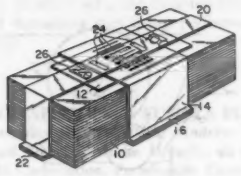
Division of Ser. No. 370,819, Apr. 22, 1982, abandoned. This application May 6, 1983, Ser. No. 492,253
Claims priority, application Japan, Sep. 24, 1981, 56-141710[U]; Nov. 16, 1981, 56-169383[U]
Int. Cl.³ B65D *71/02*
U.S. Cl. 428—57 **7 Claims**

1. A bundle comprising:

a stack of paper sheets;

a label having a nonadhesive first side positioned adjacent to and in contact with an uppermost sheet in said stack and a printable side, opposite to said first side, upon which bundle-identifying information for identifying the bundle is printed; and

a tape which is wound around the stacked sheets of paper in one direction and across the label so that at least one portion of said tape is in registry with said printable side, said tape being made of a heat-activated adhesive and transparent material, one end of said tape being heat-adhered with the other end of the tape, and wherein



said label is heat-adhered only to said tape, and not to said uppermost sheet in the stack by virtue of heat-adherence between said printable side and said registered portion of said tape and by virtue of said nonadhesive first side being in contact with said uppermost sheet, respectively, and wherein said bundle-identifying information is visually perceivable through said tape.

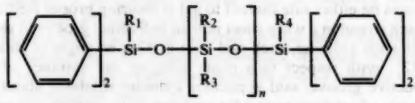
4,540,615

HIGH-DENSITY INFORMATION DISC LUBRICANT

Eugene S. Poliniak, Willingboro, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 30, 1984, Ser. No. 666,452
Int. Cl.³ G11B *3/70*; B32B *3/02*
U.S. Cl. 428—64 **6 Claims**

1. In a high-density information record having a methyl alkyl siloxane lubricant on a surface thereof, the improvement comprising adding to said lubricant an effective amount of a tetraphenyl siloxane having the formula



wherein R_1 and R_4 can be hydrogen or lower alkyl, R_2 and R_3 can be hydrogen, phenyl or lower alkyl and n is 0 or 1.

4,540,616

CARCASS SHROUD AND METHOD OF APPLICATION

Thomas F. Gilmore, Greenville, S.C., and Hershel E. Ratliff, Council Bluffs, Iowa, assignors to The Stearns & Foster Company, Cincinnati, Ohio

Filed Jan. 3, 1984, Ser. No. 567,508
Int. Cl.³ A23B *4/00*; B65D *85/70*
U.S. Cl. 428—131 **14 Claims**

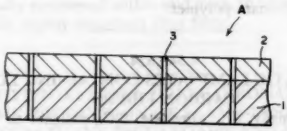
1. A carcass shroud for use during animal slaughter comprising a liquid water porous hydrophobic oleophilic polyolefin sheet, said sheet having a porosity effective to permit liquid surface water on a shrouded carcass to pass through said shroud instantly upon contact under pressure with the warm fatty surface of the carcass and to adhere smoothly to said surface while being readily separable from the firm fat of the cooled carcass.

4,540,617

FABRIC ARTICLES HAVING A FLAME-RESISTANT COATING ON AT LEAST ONE SURFACE THEREOF

Toshio Kawanishi, and Satoshi Hareyama, both of Tokyo, Japan, assignors to Teikoku Sen-I Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,232
Claims priority, application Japan, Aug. 22, 1984, 59-174776
Int. Cl.[3] B32B *3/10*
U.S. Cl. 428—137 5 Claims



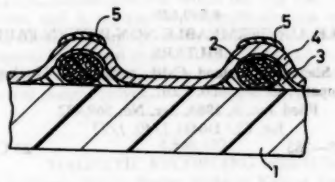
1. A flame-resistant fabric article which comprises a flame-resistant, heat-resistant woven fabric made of carbon fibers and heat-resistant synthetic fibers and a silicone resin coating formed on at least one surface of the woven fabric, the fabric article having fine through-holes permitting air to pass therethrough.

4,540,618

MAGNETIC RECORDING MEDIUM

Takashi Suzuki, Takatsuki; Kunio Hibino, Hirakata; Mikio Murai, Kawanishi; Shigeki Kawase, Toyonaka, and Koichi Shinohara, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 8, 1983, Ser. No. 521,075
Claims priority, application Japan, Aug. 12, 1982, 57-140629; Aug. 31, 1982, 57-152185; Sep. 14, 1982, 57-159841; Sep. 14, 1982, 57-159842; Nov. 18, 1982, 57-202988
Int. Cl.[3] B32B *3/00*
U.S. Cl. 428—141 15 Claims



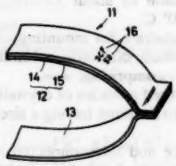
1. A magnetic recording medium comprising:
a substrate of plastic film,
an undercoating layer having 1000/mm^2 or more minute granular protrusions of 30 to 500 Å in height provided that the lateral spread is in the range of 1:1 to 20:1, said undercoating layer being formed as a coating on the face of said substrate,
a ferromagnetic thin film formed on said undercoating layer, and
a lubrication layer formed on said ferromagnetic thin film wherein said granular protrusions comprise nuclei of at least one substance selected from the group consisting of a thermoplastic resin, a crosslinked resin, carbon, an oxide of a metal and the hydrolysis product of a metal alkoxide.

4,540,619

THERMALLY SHRINKABLE LABELING BAND

Kozo Watanabe, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 10, 1984, Ser. No. 639,482
Claims priority, application Japan, Aug. 11, 1983, 58-124966
Int. Cl.[3] B32B *3/00, 7/00*
U.S. Cl. 428—192 3 Claims



1. A labelling band comprising:
a pair of adjoining strips joined together along marginal end portions thereof, one of said strips being a printable thermally non-shrinkable sheet of paper having a film of synthetic resin laminated to one surface thereof, the other of said strips being made of thermally shrinkable material united with said synthetic resin film.

4,540,620

CONDUCTIVE PATTERNS IN POLYMERIC FILMS

Timothy W. Johnson, and Mark L. Stone, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 543,581, Oct. 19, 1983, abandoned.
This application Aug. 17, 1984, Ser. No. 641,418
Int. Cl.[3] H01B *1/06*
U.S. Cl. 428—195 22 Claims

1. A method for producing conductive paths on a poly(arylene sulfide) object comprising:
altering the polymer morphology of selected areas of the object so as to produce in such areas relatively lesser polymer crystallinity; and
selectively inducing electrical conductivity in said areas of lesser polymer crystallinity.

11. A method comprising:
contacting selected areas of a poly(phenylene sulfide) film with a pulsed laser beam having an intensity of at least about 0.1 joules/cm so as to heat the selected areas to a temperature above the melting point of the poly(phenylene sulfide);
cooling the selected areas so as to produce in the selected areas a crystallinity different from that of the non-heated areas of the poly(phenylene sulfide) film;
chemically doping those areas of the thus-treated poly(phenylene sulfide) film having a relatively lower level of crystallinity with a doping agent effective to increase the electrical conductivity of the doped areas of the poly(arylene sulfide).

4,540,621

DIELECTRIC SUBSTRATES COMPRISING CORDIERITE AND METHOD OF FORMING THE SAME

Carl L. Eggerding, Ethan Allen Dr., Stormville, N.Y. 12582, and Edward A. Giess, Susan Dr., Somers, N.Y. 10589

Filed Jul. 29, 1983, Ser. No. 518,588
Int. Cl.[3] H05K *3/30, 3/00*
U.S. Cl. 428—209 11 Claims

1. A method for forming a substrate for electronic applications having a dielectric constant of less than 6 comprising;
admixing crystalline cordierite particles having a size of 0.1–10 microns with a binder and solvent therefor, casting said mixture into a sheet, drying said cast sheet into a

selfsupporting green sheet substrate and heating said green sheet substrate to burn out said binder and to sinter said particles together, thereby forming said dielectric substrate, said process further comprising the step of depositing a metallization pattern on said green sheet substrate after said casting but before said heating to sinter, said metallization pattern being of a member selected from the group consisting of molybdenum and tungsten, and wherein said crystalline cordierite has a coefficient of thermal expansion of about 15×10^{-7}° C.$^{-1}$ measured from 20° to 100° C.

7. A dielectric substrate for mounting of integrated circuit devices thereon, which dielectric substrate has a dielectric constant less than 6, comprising:

a substrate of sintered particles of crystalline cordierite, said particles prior to sintering having a size of 0.1–10 microns, and

at least two space and interconnected levels of electrical conductor patterns embedded in said substrate, said metallization pattern being of a member selected from the group consisting of molybdenum and tungsten, and wherein said crystalline cordierite has a coefficient of thermal expansion of about 15×10^{-7}° C.$^{-1}$ measured from 20° to 100° C.

4,540,622

FLEXIBLE, TRANSPARENT PANE FOR USE AS A WINDOW

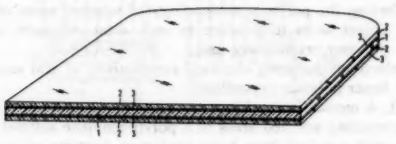
Hans-Georg Brunion, Stolberg; Christian Hiemenz, Herzogenrath; Hans Heuser, and Helmer Rädisch, both of Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 459,112, Jan. 19, 1983, abandoned. This application Jul. 3, 1984, Ser. No. 627,588

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201849

Int. Cl.^{3} **B32B** *27/40*

U.S. Cl. 428—216 **9 Claims**



1. A flexible, transparent plastic pane for use as a window characterized in that said pane is a laminate including a core comprised of polycarbonate having a thickness of about 0.3 to about 0.8 mm and having both thrust and tear reistant properties, a pair of cover layers, at least one of said layers being colored, comprised of an elastic prefabricated polyurethane foil, containing a light stabilizer and a UV-absorber, having a self-healing property, each said cover layer having a thickness of abut 0.2 to about 0.5 mm, and an adhesive of thermoplastic polyurethane disposed between said core and each said cover layer.

4,540,623

COEXTRUDED MULTI-LAYERED ARTICLES

Jang-hi Im, Midland, and William E. Shrum, St. Louis, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 542,292, Oct. 14, 1983, abandoned. This application Jan. 29, 1985, Ser. No. 696,231

Int. Cl.^{3} **B32B** *27/08, 27/36*

U.S. Cl. 428—220 **24 Claims**

1. An impact resistant laminated article in the form of an extruded sheet having a thickness of greater than 10 mils and having a multi-layered structure comprising, on the average, alternating layers of coextruded polymeric, thermoplastic materials wherein the number of layers is greater than or equal to about 40, and wherein one of said materials forming said alternating layers contains a carbonate polymer; and the alternating layers containing carbonate polymer are bound in an essentially contiguous relationship to adjacent layers of the other polymeric materials comprising said article, wherein said alternating layers are in the form of thin films each having a relatively sharply defined interface and are generally parallel to the major surface of said article; said article being comprised of from about 35 to about 90 percent by volume of said layers containing carbonate polymer.

4,540,624

ANTISTATIC LAMINATES CONTAINING LONG CARBON FIBERS

Daniel L. Cannady, Jr., Allendale, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 9, 1984, Ser. No. 597,875

Int. Cl.^{3} **D04H** *1/16*

U.S. Cl. 428—282 **8 Claims**

1. A static-dissipating, heat and pressure consolidated laminate comprising:

(A) a bottom core layer containing a plurality of fibrous sheets, and

(B) a top decorative fibrous layer disposed on the core layer, where the core and decorative layers are impregnated throughout with a cured resin and where at least the decorative layer has contacting, carbon fibers uniformly distributed therethrough, the carbon fibers constituting from about 1 wt. % to about 15 wt. % of the unimpregnated, non-carbon decorative fiber weight plus carbon fiber weight in the decorative layer, said carbon fibers being effective to dissipate static charges accumulating on the top of the decorative layer, where the cured resin remains impregnated in the laminate after heat and pressure consolidation without being carbonized.

4,540,625

FLEXIBLE AIR PERMEABLE NON-WOVEN FABRIC FILTERS

Charles H. Sherwood, Upland, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Jan. 9, 1984, Ser. No. 569,432

Int. Cl.^{3} **D04H** *1/40, 1/72*

U.S. Cl. 428—283 **23 Claims**

1. A tailorable air permeable flexible composite for use in the fabrication of filters, comprising a fiber mass formed of a randomly oriented mixture of flexible non-woven substrate fibers, and in-situ formed organic polymer fibers intertwined with said non-woven fibers and containing solid sorptive microscopic particles essentially captured against said non-woven

fibers, to form a flexible, air permeable, highly absorbent fiber filter.

16. A method of entrapping small sorptive particles within a fiber mass which comprises precipitating organic polymer fibers from an organic solvent solution of (1) a fiber-forming organic polymer and containing (2) suspended small sorptive solid particles and (3) flexible non-woven substrate fibers, and forming a fiber mass comprised of a mixture of flexible, non-woven substrate fibers and organic polymer fibers intertwined with each other and containing small solid sorptive particles interstitially positioned within said mass, to form a flexible, air permeable, highly absorbent fiber filter.

4,540,626
POLYHYDROXYALKYL POLYCARBONAMIDES FOR THE PRODUCTION OF FLAME-RESISTANT POLYURETHANE RIGID FOAMS AND INTEGRAL FOAMS

Peter Haas, Haan; Geza Avar, and Hartwig Grammes, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany

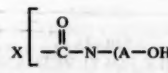
Filed Aug. 29, 1984, Ser. No. 645,205

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332792

Int. Cl.³ C08G *18/14;* B32B *29/00*

U.S. Cl. 428—318.8 **12 Claims**

1. In a process for the production of flame-resistant polyurethane rigid foams and/or polyurethane integral skin foams by the reaction of relatively high molecular weight compounds containing at least two isocyanate reactive hydrogen atoms with polyisocyanates and optionally chain lengthening agents having molecular weights of from 32 to 399, and optionally in the presence of catalysts and organic blowing agents, the improvement wherein the reaction mixture contains reactive flame-retarding agents, said agents being the poly-bis-(N,N-hydroxyalkyl)-amides of polybasic aliphatic or cycloaliphatic carboxylic acids corresponding to the following formula:



wherein n represents an integer from 2 to 6; X is selected from the group consisting of a bond (when n=2), a n-valent alkane group optionally substituted with hydroxyl groups, and a C_4-C_6-cycloalkane group in which the ring may contain heteroatoms and A represents a straight chained or branched C_2–C_6-alkylene group optionally containing a hydroxyl group, said agents being used in quantities of from 11.5 to 50 parts by weight, based on 100 parts by weight of the relatively high molecular weight polyol.

4,540,627
MAGNETIC RECORDING MEDIUM

Akio Ishizawa, Tokyo; Toshio Hukaya; Katuya Kumagai, both of Yokohama, and Tatuo Takeuchi, Zushi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 17, 1984, Ser. No. 631,754

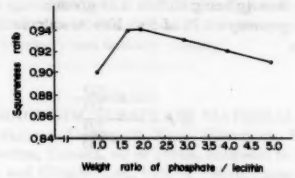
Claims priority, application Japan, Aug. 19, 1983, 58-150155

Int. Cl.³ G11B *5/70, 5/72*

U.S. Cl. 428—328 **5 Claims**

1. A magnetic recording medium which comprises (i) magnetic particles; (ii) a phosphate represented by the formula:

wherein R^1, R^2 and R^3 may be the same or different and each is represented by the formula $R^4O—CH_2O—_n$, wherein R^4 is an alkyl group having 8 to 20 carbon atoms or an alkylphenyl group whose alkyl group moiety has 8 to 20 carbon atoms, and n is an integer of 2 to 10, or by the formula HO—, with the proviso that at least one of R^1, R^2 and R^3 is represented by said formula $R^4O—CH_2CH_2O—_n$; (iii) a lecithin; and (iv) a binder, wherein the weight mixing ratio of said phosphate and said lecithin ranges from about 5:1 to about 1:1.



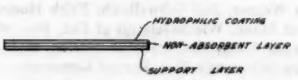
4,540,628
HYDROPHILIC SHEET AND METHOD OF MAKING

Martin K. Oberdeck, Jacksonville, Fla., and John R. Koza, 2575 Peachtree Rd., NE, #24C, Atlanta, Ga. 30305, assignors to John R. Koza, Atlanta, Ga.

Continuation of Ser. No. 207,882, Nov. 18, 1980, abandoned, which is a continuation of Ser. No. 10,249, Feb. 7, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 430,242

Int. Cl.³ B32B *15/08, 27/20*

U.S. Cl. 428—336 **4 Claims**



1. A composite sheet suitable for printing thereon by an ink jet system and intended for use as a lottery ticket, said sheet having a hydrophilic surface formed on a substrate having a normally non-absorbent surface, said sheet comprising:

an aluminum foil having a non-absorbent surface, and

a removable opaque hydrophilic coating on said surface,

said coating consisting of hydroxypropyl cellulose and a finely divided amorphous silica as flatting agent.

4,540,629
HOLLOW MICROSPHERES WITH ORGANOSILICON-SILICATE WALLS

Bruce W. Sands, Malvern, and Robert J. Nehring, Jr., Lansdale, both of Pa., assignors to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 366,502, Apr. 8, 1982, abandoned. This application Feb. 27, 1984, Ser. No. 583,559

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—402 **22 Claims**

1. Hollow microspheres of 5 to 300 microns diameter with shells containing alkali metal silicate, a polysalt, an organosilicon compound multiply bonded within said silicate shell, said microspheres being characterized in that:

(a) the ratio of polysalt solids to silicate solids is between 0.02:1 and 3.0:1, said polysalt being an inorganic salt of an alkali metal and/or ammonium cations wherein the anion to cation ratio is reduced when the salt is dissolved and becomes hydrolyzed and said alkali metal silicates having 1.5 to 4.0 moles of SiO_2 per mole of M_2O wherein M is sodium or potassium;

(b) the organosilicon constitutes 0.01 to 4.0% by weight of the microspheres, said organosilicon being the thermally and hydrolytically stable portion of an initial organosilicon compound having at least one thermally stable and

non-hydrolyzable organic group and two or three reactive groups;

(c) the ratio of true density to bulk density being between 1.2 and 1.9, the true density being 0.05 to 0.90 g/cm^3 and the bulk density being 0.05 to 0.24 g/cm^3;

(d) the porosity (%P) of 5 to 10% as calculated by the formula

$$\%P = \frac{1 - \frac{ED}{TD}}{1 - \frac{ED}{2.45}}$$

wherein ED is the effective density which has a value of 0.05 to 0.90 g/cm^3 and TD is the true density as recited in section (c) and 2.45 is the density of the wall in g/cm^3.

4,540,630

METAL-BACKED LAYERED COMPOSITE AND METHOD OF MAKING SAME

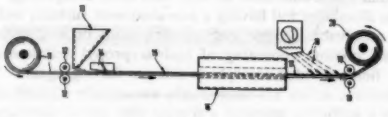
Karl-Heinz Wegner, Bad Schwalbach; Erich Hodes, Rosbach, and Horst Mann, Wiesbaden, all of Fed. Rep. of Germany, assignors to Glyco-Metall-Werke Daelen & Loos GmbH, Wiesbaden-Schierstein, Fed. Rep. of Germany

Filed Jun. 7, 1983, Ser. No. 501,776

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221785

Int. Cl.^{3} B44D *1/09*

U.S. Cl. 428—408 **13 Claims**



7. A method of making a composite material which comprises the steps of:

(a) preparing a composition of particles of a matrix-forming polyether-etherketone thermoplastic synthetic resin having a particle size of at most 100 microns, and short graphite fibers having a length of at most 1 mm by milling the thermoplastic synthetic resin in liquid nitrogen to said particle size, then adding the graphite fibers to the milled resin, and blending said graphite fibers in the milled resin to form said composition such that said graphite fibers are incorporated in said composition in an amount of 20 to 40% by weight and have a length of substantially 0.04 mm to 0.2 mm and a diameter of 0.005 mm to 0.03 mm;

(b) applying the prepared composition to a roughened surface of a metallic substrate and doctoring said composition onto said surface to form a layer of uniform thickness thereon;

(c) heating said layer to a temperature of substantially 50° to 70° K. above the melting point of the thermoplastic of said layer to transform said layer into a homogeneous coating on said substrate; and

(d) cooling said substrate.

4,540,631

TREATMENT OF POLYMER USING SILVER

Harold D. Boultinghouse, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 28, 1983, Ser. No. 479,243

Int. Cl.^{3} B32B *27/06*

U.S. Cl. 428—419 **13 Claims**

5. A method for applying a silver coating to a poly(arylene sulfide) substrate comprising the steps of

increasing the surface wettability of a surface of the poly(arylene sulfide) substrate to be coated, and

apply treating materials consisting essentially of an aqueous solution consisting essentially of $AgNO_3$ to the surface at a temperature effective for causing the deposition of a silver coating onto the surface.

13. An article of manufacture comprising poly(arylene sulfide) and silver deposited on the poly(arylene sulfide) according to the method of claim 5.

4,540,632

COATING COMPOSITION FOR ELASTOMERIC PACKAGING COMPONENTS

George A. Finn, Chadds Ford, Pa., assignor to The West Company, Phoenixville, Pa.

Filed Feb. 17, 1984, Ser. No. 581,179

Int. Cl.^{3} B22B *27/00*; C08K *5/02*; C08L *27/18, 33/10*

U.S. Cl. 428—422 **2 Claims**

1. A solution for coating an elastomeric article to facilitate the insertion and sealing thereof in a complementary packaging element, and inertness to medicinal fluids, which comprises about 1.5 to about 6% polytetrafluoroethylene and about 0.5 to about 2% poly n-butyl methacrylate in solvent comprising about 68 to about 92% 1,1,1-trichlorethane and about 6 to about 24% of 1,1,2-trichloro-2,2,1-trifluoroethane and having a specific gravity of about 1.2 to about 1.4.

2. A dried residue of the solution of claim 1, in the form of a film of said poly n-butyl methacrylate containing said polytetrafluoroethylene, deposited on an elastomer substrate.

4,540,633

WATER DISPERSIBLE POLYURETHANE ADHESIVE COMPOSITIONS AND ADHESIVE LAYER FORMED THEREFROM

Helmut W. Kucera, West Springfield, Pa., and Samy K. Saad, Tonawanda, N.Y., assignors to Textron, Inc., Providence, R.I.

Filed Apr. 20, 1983, Ser. No. 486,728

Int. Cl.^{3} B32B *27/40*

U.S. Cl. 428—423.1 **9 Claims**

1. A layer from which water has been removed comprising an incompletely reacted mixture of a first component comprising an oligourethane composition with a second component which can react with the first component; said first component comprising an oligourethane, said oligourethane comprising a polyurethane composition having an average molecular weight of less than about 15,000 and containing sufficient chemically bound hydrophilic groups selected from anionic groups, cationic groups, ethylene oxide residue and mixtures thereof to render the composition water dispersible, the molecules of said polyurethane composition comprising a plurality of amino groups or semicarbazide groups which have at least one

$$-\overset{|}{N}H$$

group; and said second component comprising an organic compound dispersible in an aqueous solvent, the molecules of said organic compound containing a plurality of groups capable of reacting selectively with the amino or semicarbazide groups within the layer, said layer being tacky at a temperature below about 90° C.

4,540,634

ARTICLES COATED WITH TRANSPARENT, ABRASION RESISTANT COMPOSITIONS

Lysander T. Ashlock, Lake Forest; Harold Mukamal, Seal Beach, and William H. White, La Puente, all of Calif., assignors to Swedlow, Inc., Garden Grove, Calif.

Division of Ser. No. 136,757, Apr. 3, 1980, Pat. No. 4,500,669, which is a continuation of Ser. No. 845,915, Oct. 27, 1977, abandoned. This application Dec. 28, 1984, Ser. No. 687,024
Int. Cl.³ B32B 5/16
U.S. Cl. 428—451 13 Claims

1. An article manufactured by applying to at least one surface of a substrate, a coating composition which forms a transparent, abrasion-resistant coating upon curing, said coating composition containing an effective abrasion resistant amount of a colloidal dispersion of a water insoluble dispersant in a water-alcohol solution of the partial condensate of $R(Si(OH)_3)$, wherein R is an organic radical, and said dispersant is a metal or a metal alloy, and curing said coating composition.

4,540,635

MODIFIED COLOPHONY ROSINS, A PROCESS FOR THEIR PREPARATION, THEIR USE AND PAPER-SIZING AGENTS CONTAINING SUCH MODIFIED COLOPHONY ROSINS

Helmut Ronge; Erhard Prantz, and Wolfgang Schoerkhuber, all of Krems, Austria, assignors to Krems-Chemie, Gesellschaft mbH, Krems, Austria

Filed Mar. 15, 1984, Ser. No. 589,982
Claims priority, application Austria, Jan. 19, 1984, 169/84
Int. Cl.³ B32B 9/06; C08L 93/00
U.S. Cl. 428—498 23 Claims

1. A colophony rosin reinforced with formaldehyde and/or an α,β-unsaturated carbonyl compound and additionally esterified with an amino alcohol, wherein the colophony rosin is esterified with 2.5 to 10% by weight with one or more tertiary amino alcohols, based on the starting rosin.

4,540,636

METAL BEARING ELEMENT WITH A SCORE-RESISTANT COATING

Bernard A. Mac Iver, Lathrup Village; James C. Erskine, Jr., Birmingham, and John C. Bierlein, Washington, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1983, Ser. No. 565,395
Int. Cl.³ B32B 5/14
U.S. Cl. 428—610 1 Claim

1. A bearing element having and adherent, hard, antifriction coating thereon, wherein the bearing element has a surface consisting essentially of an iron-based alloy for sliding contact with metals, such as aluminum based alloys, a carbonized layer thereon of a sulfur-free methacrylate-type resin that contains silicon carbide, graphic-like and diamond-like crystalline microstructures therein, and an interfacial zone between the carbonized coating and the iron-based alloy surface containing chemical compounds of iron and carbon that bond the carbonized coating to the iron-based alloy surface.

4,540,637

PROCESS FOR THE APPLICATION OF ORGANIC MATERIALS TO GALVANIZED METAL

David F. Geary, Severna Park; Dennis R. Honchar, Ellicott City, and Robert P. Miller, Annapolis, all of Md., assignors to Baltimore Aircoil Company, Inc., Jessup, Md.

Continuation-in-part of Ser. No. 221,176, Dec. 29, 1980, abandoned. This application Jul. 15, 1982, Ser. No. 398,517
Int. Cl.³ B05D 3/02
U.S. Cl. 428—626 8 Claims

1. A process for coating hot dip or electroplated galvanized metal consisting of: acid etch cleaning without roughening the galvanized metal and without depositing significant amounts of crystalline bonding sites on said galvanized metal by contacting the galvanized metal with a dilute acid solution; thoroughly rinsing said metal: drying said metal applying within 6 hours of drying a homogenous organic resin powder coating consisting of epoxy, polyester or acrylic and hybrid resins thereof of a thickness of at least 0.003 inches on the essentially zinc oxide free galvanized metal and then curing said organic resin powder coated metal at an elevated temperature to produce a virtually impervious uniform coating.

4,540,638

NON-MAGNETIC SUBSTRATE MATERIAL

Masahiko Sakakihara, Kumagaya; Kenzi Hasegawa, Saitama, and Akira Iwama, Katsuta, all of Japan, assignors to Hitachi Metals, Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,592
Claims priority, application Japan, Mar. 22, 1983, 58-47597
Int. Cl.³ B32B 15/00
U.S. Cl. 428—693 6 Claims

1. A thin film magnetic assembly for a magnetic head, said assembly comprising a non-magnetic substrate material and a magnetic metallic film vapor-deposited on the substrate material, wherein the substrate material has a thermal expansion coefficient approximating that of the magnetic metallic film, a NaCl-type lattice structure and a nickel-manganese oxide composition represented by the formula:

$$Ni_xMn_{2-x}O_2$$

wherein $0.05 \leqq x < 1$, said composition optionally containing not more than 10% by weight of at least one individual element of the group consisting of Al, Cr, Si, Sn and Ba as a secondary component on the basis of said nickel-maganese oxide.

4,540,639

METHOD AND APPARATUS FOR MAINTAINING THE PH IN ZINC-BROMINE BATTERY SYSTEMS

Patrick G. Grimes, Westfield, N.J., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 445,969, Dec. 1, 1982, abandoned. This application Jun. 19, 1984, Ser. No. 622,183
Int. Cl.³ H01M 8/04
U.S. Cl. 429—17 8 Claims

1. A method for recombining gaseous decomposition hydrogen with bromine in a zinc-bromine battery system, comprising the steps of: reacting gaseous decomposition hydrogen with bromine within said zinc-bromine system in the presence of a catalyst supported on an electronically conductive substrate and disposed at a gas/liquid interface of said system for causing formation of hydrogen and bromide ions, whereby said gaseous decomposition hydrogen is consumed and the pH of the system is substantially maintained at a given value.

5. A zinc-bromine battery system which consumes its decomposition gaseous hydrogen so that the pH of the system is substantially maintained at a given value, comprising a catalyst supported on an electronically conductive substrate and disposed at a gas/liquid interface of said system for causing formation of hydrogen and bromide ions in the presence of said decomposition gaseous hydrogen and bromine.

4,540,640

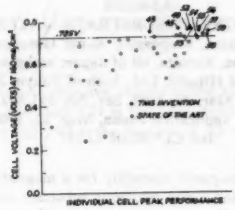
COATED POWDER FOR ELECTROLYTE MATRIX FOR CARBONATE FUEL CELL

Charles D. Iacovangelo, and Kenneth W. Browall, both of Schenectady, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 29, 1983, Ser. No. 489,431
Int. Cl.³ H01M 8/00
U.S. Cl. 429—41 6 Claims

1. A porous electrolyte tape structure for supporting electrolyte in a molten carbonate fuel cell consisting essentially of a plurality of electrolyte carbonate-coated ceramic particles

having no significant portion of the ceramic particles exposed, said ceramic particles not being significantly deleteriously effected by said molten carbonate fuel cell, said ceramic particles ranging in diameter from about 0.1 micron to about 5 microns, said electrolyte carbonate coating consisting essentially of a carbonate useful as an electrolyte in a molten carbonate fuel cell and ranging from about 5% by volume to about 30% by volume of said coated ceramic particle, said coated



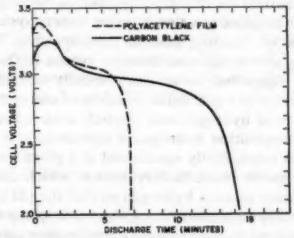
ceramic particle not differing significantly in diameter from said ceramic particle, said tape structure having a thickness substantially greater than the diameter of the ceramic particles and said thickness encompassing a plurality of said particles, said porous tape having a substantially uniform thickness of less than 30 mils and a porosity ranging from about 30% by volume to about 65% by volume of the total volume of said tape.

4,540,641

ELECTROCHEMICAL CELL

Robert C. McDonald, Stow; Wei-Tao Wang, Stoneham; Peter Cukor, Natick, and Michael F. Rubner, Chelmsford, all of Mass., assignors to GTE Communications Products Corporation and GTE Laboratories Incorporated, both of Waltham, Mass.

Filed Jul. 18, 1983, Ser. No. 514,729
Int. Cl.³ H01M *4/36*
U.S. Cl. 429—105 **10 Claims**



1. An electrochemical cell comprising
an oxidizable active anode material;
a cathode current collector consisting of a mixture of a polymer and carbon black, and a supporting substrate; said polymer being selected from the group consisting of polyacetylenes, polyphenylenes, polyheterocyclics, mixtures thereof, copolymers thereof, and cross linked polymers thereof; and
an electrolytic solution, in contact with the anode material and cathode current collector, comprising a reducible liquid cathode material and an electrolyte solute dissolved therein.

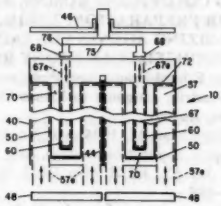
6. An electrochemical cell comprising
an oxidizable active anode material;
a cathode current collector consisting of a layer of a polymer adherent to an inert electrically-conductive substrate; said polymer being selected from the group consisting of polyacetylenes, polyphenylenes, polyheterocyclics, mixtures thereof, copolymers thereof, and cross linked polymers thereof; and
an electrolytic solution, in contact with the anode material and cathode current collector, comprising a reducible liquid cathode material and an electrolyte solute dissolved therein.

4,540,642

CELL DESIGN FOR LITHIUM ALLOY/METAL SULFIDE BATTERY

Thomas D. Kaun, New Lennox, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1984, Ser. No. 595,203
Int. Cl.³ H01M *2/14*
U.S. Cl. 429—131 **11 Claims**



1. A lithium alloy/iron sulfide cell or battery, comprising an exterior housing, positive and negative current collector subassemblies disposed in the housing and having spaced mutually paired perforated faces, means securing the positive current collector subassembly to the housing operable to hold its major faces spaced from the housing, positive electrode material confined between the housing and the perforated faces of the positive electrode subassembly and means to seal the positive electrode material therein, separator means disposed between the positive and negative current collector subassemblies for electrically insulating them from one another and also supporting the negative current collector subassembly within and relative to the positive current collector subassembly, negative electrode material confined within the negative electrode subassembly and means to seal the negative electrode materials therein, and means to seal the housing.

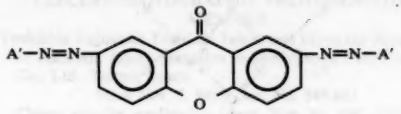
4,540,643

TETRAZONIUM SALT COMPOUNDS, NOVEL DISAZO COMPOUNDS, METHOD FOR THE PRODUCTION THEREOF AND DISAZO COMPOUND-CONTAINING ELECTROPHOTOGRAPHIC ELEMENTS

Kyoji Tsutsui, Mishima, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 597,991
Claims priority, application Japan, Apr. 26, 1983, 58-73177; Apr. 28, 1983, 58-75586
Int. Cl.³ G03G *5/06*
U.S. Cl. 430—58 **16 Claims**

1. An electrophotographic element comprising an electrically conductive substrate and a photosensitive layer, formed on said substrate, which is consisted essentially of a disazo compound as a charge carrier generating material represented by the general formula (VIII):



(VIII)

(wherein, A' stands for a coupler group.), a charge transfer material and an insulating binder.

4,540,644

XEROGRAPHIC TONER COMPOSITION FOR PRODUCING RAISED IMAGES

Ezekiel J. Jacob, 79 Washington St., Brooklyn, N.Y. 11201

Division of Ser. No. 283,437, Jul. 15, 1981, Pat. No. 4,459,344, and a continuation-in-part of Ser. No. 618,008, Sep. 30, 1975, abandoned, which is a division of Ser. No. 379,468, Jul. 16, 1973, Pat. No. 3,945,934, which is a continuation-in-part of Ser. No. 100,516, Dec. 21, 1970, abandoned. This application Apr. 24, 1984, Ser. No. 603,424

Int. Cl.³ G03G *9/16, 9/08*

U.S. Cl. 430—110 **5 Claims**

1. A Xerographic toner composition for producing raised print reproductions comprising a stable, dry, free-flowing, self-contained intumescent electroscopic powder mixture including a thermoadhesive agent, a dry pigment and a dry intumescing agent, said intumescing agent being comprised of solid particulate matter capable of liberating nitrogen gas by thermal decomposition during fixation of the thermoadhesive toner to a carrier sheet in the heating zone of a Xerographic copier.

4,540,645

MAGNETIC BRUSH DEVELOPMENT METHOD

Nobuyasu Honda, Tenri; Toshikazu Matsui, Kishiwada; Akira Fushida, Suita; Toshimitsu Ikeda, Himeji; Kenji Takahashi, Hirakata; Hideo Fukuda, Katano; Yasushi Kamezaki, Sakai, and Takashi Teshima, Yokohama, all of Japan, assignors to Mita Industrial Co Ltd, Osaka, Japan

Filed Jan. 27, 1984, Ser. No. 574,575

Claims priority, application Japan, Jan. 31, 1983, 58-12971; Mar. 23, 1983, 58-47266

Int. Cl.³ G03G *13/09, 15/09*

U.S. Cl. 430—122 **11 Claims**

1. A magnetic brush development method comprising supplying a two-component type developer comprising a mixture of magnetic carrier particles with toner particles chargeable by friction with the magnetic carrier particles onto a developing sleeve consisting of a non-magnetic sleeve having a magnet installed therein to form a magnetic brush of the developer, and bringing the magnetic brush in sliding contact with the surface of a photosensitive material having an electrostatic latent image formed thereon in the state where a bias voltage is applied between the photosensitive material and the sleeve, whereby a toner image corresponding to the electrostatic latent image is formed, wherein the two-component type developer comprises a ferrite carrier having a particle size of from about 20 to about 100 microns and electroscopic toner particles at a weight ratio of from 4/1 to 20/1 and wherein the development is carried out under conditions satisfying requirements represented by the following formulae:

$$5\times10^9 \geqq R \geqq 1\times10^8,$$

$$d \leqq (1.485\times10^5)/(\log R)^{5.3}$$

and

$$d \leqq (1.485\times10^5)/(\log R)^{5.5}$$

wherein d stands for the clearance (mm) between the sleeve and the photosensitive material and R stands for the electric resistance (Ω) of the two-component type developer located between the sleeve and the photosensitive material,

wherein the non-magnetic sleeve is moved at the position for the sliding contact with the developer in the direction opposite to the moving direction of a drum and the magnet in the sleeve is kept stationary during the development, and the development is carried out under conditions satisfying requirements represented by the following formulae:

$$2.4 \geqq |v/V| \geqq 1.5,$$

$$|v/V| \geqq -0.12\theta + 1.8$$

and

$$\theta \leqq 5$$

wherein θ stands for the preset angle (degrees), in the downstream direction of rotation of the drum, of the magnetic pole closest to the standard line connecting the center of the drum to the center of the sleeve, V stands for the peripheral speed of the drum and v stands for the peripheral speed of the sleeve.

4,540,646

METHOD OF DEVELOPING AN ELECTROSTATIC LATENT IMAGE

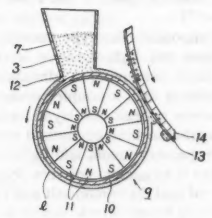
Jun Kambara; Yuzo Ohmuro, and Nin-ichi Kamogawa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 326,588, Dec. 2, 1981, which is a division of Ser. No. 832,019, Sep. 9, 1977, which is a division of Ser. No. 608,274, Aug. 27, 1975, abandoned. This application Jul. 9, 1984, Ser. No. 628,767

Claims priority, application Japan, Aug. 28, 1974, 49-99385

Int. Cl.³ G03G *13/09*

U.S. Cl. 430—122 **9 Claims**



1. A method for forming a toner image on a photosensitive material bearing an electrostatic latent image comprising

(a) introducing a one component developer consisting of fine toner particles, said particles containing a resin and ferromagnetic powder dispersed in said resin in such a fashion that a portion of said ferromagnetic powder is exposed on the surface of said toner particles, said toner particles having a specific resistivity of at least 10^{14} ohm cm and being capable of accepting a triboelectric charge,

into a toner vessel which includes a regulating plate for controlling the amount of toner to be fed,

(b) feeding said toner onto a toner feeder comprising a non-magnetic cylinder drum and a plurality of magnets disposed therein so that south and north poles are directed to the inner surface of non-magnetic cylinder,

(c) carrying said toner, by rotary movement of either said non-magnetic cylinder or said plurality of magnets, along the surface of said non-magnetic cylinder into close proximity to said electrostatic latent image,

said toner particles developing a triboelectric charge of a polarity opposite to that of said electrostatic latent image

during steps (a) through (c) in the absence of a corona discharging device, and

(d) bringing said toner particles into contact with said electrostatic latent image.

4,540,647

METHOD FOR THE MANUFACTURE OF PHOTOCONDUCTIVE INSULATING ELEMENTS WITH A BROAD DYNAMIC EXPOSURE RANGE

Paul M. Borsenberger, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,604

Int. Cl.³ G03G *5/082*; B05D *3/06*

U.S. Cl. 430—128 **11 Claims**

1. In a method for the manufacture of a photoconductive insulating element comprising an electrically-conductive support, a barrier layer overlying said support, and a layer of doped α-Si(H) overlying said barrier layer, wherein said layer of doped α-Si(H) is formed by a process of plasma-induced dissociation of a gaseous mixture of a silane and a doping agent, the improvement which comprises controlling the temperature of said dissociation process so that an initial major portion of said layer of doped α-Si(H) is formed at a temperature in the range of from 200° C. to 400° C. and a final minor portion of said layer of doped α-Si(H) is formed at a temperature in the range of from 125° C. to 175° C.

4,540,648

TWO-COMPONENT DIAZOTYPE MATERIAL WITH ULTRAVIOLET LIGHT-ABSORBING DYE SALT OF A BENZOTHIAZOLE

Siegfried Scheler, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 28, 1984, Ser. No. 584,547

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307364

Int. Cl.³ G03C *1/60, 1/54, 1/58*

U.S. Cl. 430—172 **19 Claims**

1. A two-component diazotype material, comprising a support and at least one light-sensitive layer provided on said support, said layer containing in admixture at least one light-sensitive diazonium salt, a coupler component, and an acid stabilizer, wherein at least one layer further contains in said admixture a light-absorbing compound which absorbs light in the ultraviolet spectral region, said light-absorbing compound (i) being present in an amount between about 2 and 30%, based on the weight of said diazonium salt and (ii) comprising a dye salt of at least one benzothiazole which is capable of converting into a corresponding leuco base by the action of an alkaline medium, whereby said dye salt at least partially loses absorptivity toward radiation in the long-wave ultraviolet and short-wave visible spectral region.

4,540,649

WATER DEVELOPABLE PHOTOPOLYMERIZABLE COMPOSITION AND PRINTING PLATE ELEMENT CONTAINING SAME

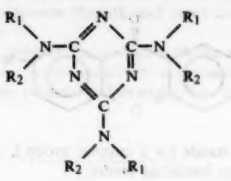
Kiyomi Sakurai, San Diego, Calif., assignor to Napp Systems (USA) Inc., San Marcos, Calif.

Filed Sep. 12, 1984, Ser. No. 649,905

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—270 **13 Claims**

1. A water developable, photopolymerizable composition, comprising about 20 to about 95% by weight, based on the total weight of the composition, of at least one water soluble polymer; about 5 to about 75 weight percent of the condensation reaction product of N-methylol acrylamide, N-methylol methacrylamide, N-alkyloxymethyl acrylamide or N-alkyloxymethyl methacrylamide and a melamine derivative of the following formula:



wherein, R_1 is CH_2OR, R_2 is H or CH_2OR, and R is C_1–C_4 alkyl; and at least one photopolymerization initiator.

4,540,650

PHOTORESISTS SUITABLE FOR FORMING RELIEF STRUCTURES OF HIGHLY HEAT-RESISTANT POLYMERS

Rudolf Klug, Aschaffenburg; Hartmut Härtner, Mühltal; Hans-Joachim Merrem, Seeheim, and Karl H. Neisius, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,781

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1982, 3233912

Int. Cl.³ G03C *1/70, 5/16*; C08G *69/48*

U.S. Cl. 430—281 **21 Claims**

1. In a photoresist comprising a soluble polyamide-ester prepolymer containing radiation-reactive radicals bonded to the repeating unit of the prepolymer through carboxylic ester linkages; said amide having the structure of the reaction product of a carboxylic aid and an amine, the improvement wherein said photoresist further comprises at least 3% by weight, relative to the weight of said soluble prepolymer, of at least one radiation-reactive polymerizable allyl compound having a boiling point above 180° C., the allyl groups thereof being bonded through an oxygen, sulfur or nitrogen atom.

15. In a process for forming relief structures of highly heat-resistant polymers, comprising the steps of applying a photoresist comprising a soluble polyamide-ester prepolymer containing radiation-reactive radicals bonded to the repeating unit of the prepolymer through carboxylic ester linkages, said amide having the structure of the reaction product of a carboxylic acid and an amine, said photoresist being applied in the form of a layer or sheet to a substrate, drying the layer or sheet, irradiating the dried, radiation-sensitive layer or sheet through a negative original or using a guided collimated beam, dissolving out or stripping off the non-irradiated portions of the layer or sheet to form a relief structure, the improvement wherein said photoresist further comprises at least 3% by weight, relative to the weight of said soluble prepolymer, of at least one radiation-reactive polymerizable allyl compound having a boiling point above 180° C., the allyl groups thereof being bonded through an oxygen, sulfur or nitrogen atom.

21. The process of claim 15, wherein the resultant relief structure is heat-treated.

4,540,651

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Yoshihide Fujimaki; Yoshiaki Takei, and Hiroyuki Nomori, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1983, Ser. No. 549,601

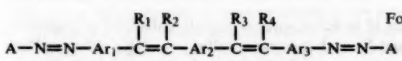
Claims priority, application Japan, Nov. 10, 1982, 57-197165; Nov. 10, 1982, 57-197166; Nov. 30, 1982, 57-208512; Nov. 30, 1982, 57-208513; Nov. 30, 1982, 57-208515; Nov. 30, 1982, 57-208516; Nov. 30, 1982, 57-208518; Nov. 30, 1982, 57-208519; Dec. 8, 1982, 57-214033; Dec. 8, 1982, 57-214036; Dec. 8, 1982, 57-214037; Dec. 8, 1982, 57-214034

Int. Cl.[3] **G03G** *5/06, 5/14*

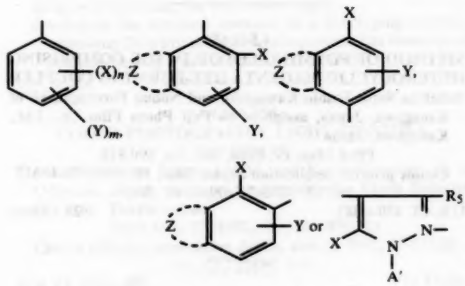
U.S. Cl. 430—72 **31 Claims**

1. An electrophotographic photosensitive member comprising a photosensitive layer comprising a combination of a carrier generating phase and a carrier transporting phase provided on an electroconductive support, said carrier generating phase containing a bisazo compound represented by the formula [I] shown below and said carrier transporting phase containing a carrier transporting material selected from the group consisting of at least one of styryl compounds represented by the formula [II] shown below, amine derivatives represented by the formula [III], hydrazone compounds represented by the formula [IV], [V] and [VI] and carbazole derivatives represented by the formula [VII]:

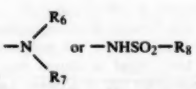
Formula [I]



wherein each of Ar_1, Ar_2 and Ar_3 represents a divalent carbocyclic aromatic residue or a divalent heterocyclic aromatic residue; each of R_1, R_2, R_3 and R_4 represents an electron attracting group or a hydrogen atom, provided that 1 or 2 of R_1 to R_4 are electron attracting groups and the case where R_1 and R_2 or R_3 and R_4 are electron attracting groups at the same time is excluded; A is a group represented by the following formula:

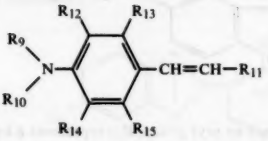


wherein X is a hydroxyl group,



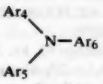
where each of R_6 and R_7 is a hydrogen atom, an alkyl group and R_8 is an alkyl group or an aryl group; Y is a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, a carboxyl group, a sulfo group, a carbamoyl group or a sulfamoyl group; Z is a group of atoms necessary for forming a carbocyclic aromatic ring or a heterocyclic aromatic ring; R_5 is a hydrogen atom, an amino group, a carbamoyl group, a carboxyl group or its ester group; A' is an aryl group; n is an integer of 1 to 3; and m is an integer of 0 to 4,

Formula [II]



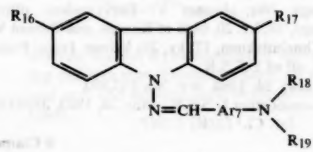
wherein each of R_9 and R_{10} represents an alkyl group or phenyl group; R_{11} represents a phenyl group, naphthyl group, anthryl group, fluorenyl group or heterocyclic group; each of R_{12} to R_{15} represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group or an amino group,

Formula [III]



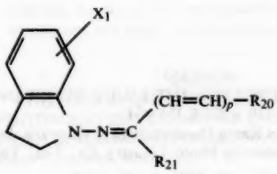
wherein each of Ar_4 and Ar_5 represents a phenyl group; and Ar_6 represents a phenyl group, naphthyl group, anthryl group, fluorenyl group or heterocyclic group,

Formula [IV]



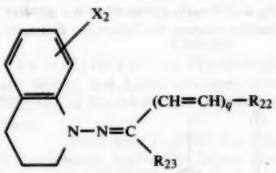
wherein each of R_{16} to R_{17} represents a hydrogen atom or a halogen atom; each of R_{18} and R_{19} represents an aryl group; and Ar_7 represents an arylene group,

Formula [V]



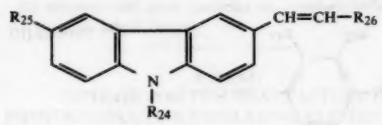
wherein R_{20} represents an aryl group or a heterocyclic group; R_{21} represents a hydrogen atom, an alkyl group or an aryl group; X_1 represents a hydrogen atom, a halogen atom, an alkyl group, an amino group or an alkoxyl group; and p represents an integer of 0 or 1,

Formula [VI]



wherein R_{22} represents an aryl group or a heterocyclic group; R_{23} represents a hydrogen atom or an alkyl group; X_2 represents a hydrogen atom, a halogen atom, an alkyl group, an amino group, an alkoxy group or a cyano group; and q represents an integer of 0 or 1,

Formula [VII]



wherein R_{24} represents an aryl group; R_{25} represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an amino group or a hydroxyl group; and R_{26} represents an aryl group or a heterocyclic group.

4,540,652

MATERIAL FOR THE ELECTROSTATIC DATA RECORDING CONTAINING SILICON AND TITANIUM OXIDES

Alexei A. Chuiko, ulitsa Saxoganskogo 43, kv. 26, Kiev; Anatoly V. Morev, ulitsa Zhdanova, 19, kv. 27; Alexandr S. Golovkov, Institutsky proezd, 2, kv. 94, both of poselok Pravdinsky, Moskovskaya oblast; Valentin A. Smirnov, prospekt 50-letia SSSR, 17a, kv. 32, Kaunas; Evgeny F. Voronin, ulitsa Entuziastov, 29/2, kv. 49, Kiev; Raisa A. Evlakhova, ulitsa Chernyakhovskogo, 88a, Kaunas; Galina Y. Guba, prospekt Nauki 142/1, korpus 14, kv. 13/5, Kiev; Iolita R. Slushnene, ulitsa Chernyakhovskogo, 88a; Arunas V. Pasvyanskas, ulitsa Chernvakhovskogo, 19, kv. 20, both of Kaunas, and Roman V. Sushko, ulitsa Khnelnitskogo, 17, kv. 29, kalush, Ivano-Frankovskaya oblast, all of U.S.S.R.

Filed May 24, 1984, Ser. No. 613,891

Claims priority, application U.S.S.R., May 24, 1983, 3596199

Int. Cl.[3] G03G *5/087*

U.S. Cl. 430—84 **6 Claims**

1. A material for the electrostatic data recording, consisting of an electrically conducting support and a dielectric layer which contains in % by weight: 17–80 of a polymeric binder, 20–83 of a mixed finely divided pyrogenic silicon and titanium oxide containing 10–50% of titanium modified with a polymethylcyclosiloxane.

4,540,653

METHOD OF IMPROVING THE LIGHT RESISTANCE OF A DYE IMAGE

Toyoki Nishijima, and Kaoru Onodera, both of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,812

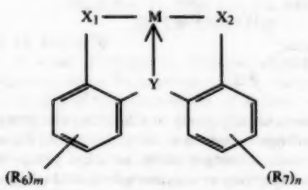
Claims priority, application Japan, Aug. 31, 1983, 58-160929

Int. Cl.[3] G03C *7/40, 7/26*

U.S. Cl. 430—372 **24 Claims**

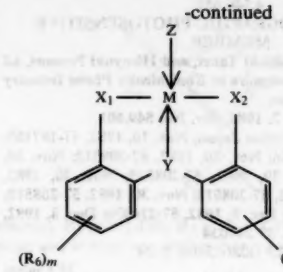
1. A photographic element comprising a support having thereon a layer containing a silver halide emulsion and an anilino-type magenta coupler, wherein said layer comprises an organic solvent having a dielectric constant of not greater than 6.5 and a metallic complex having the following Formula (Ia), (IIa), or (IIIa):

Formula (Ia)

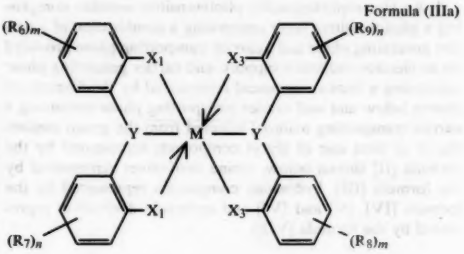


-continued

Formula (IIa)



Formula (IIIa)



wherein M is nickel, copper, cobalt, palladium or platinum; X_1 and X_2 each is oxygen, sulfur or $—NR_5$, wherein R_5 is hydrogen or an alkyl, aryl or hydroxyl radical; X_3 is a hydroxyl or mercapto radical; Y is oxygen or sulfur; Z is a compound coordinatable to M; and R_6, R_7, R_8 and R_9 each is an alkyl radical, an aryl radical, an alkoxy radical, an aryloxy radical, an alkoxycarbonyl radical, an aryloxycarbonyl radical, an acylamino radical, an arylamino radical, an alkylamino radical, a carbamoyl radical, a sulfamoyl radical, a sulfonamide radical, a sulfonyl radical, or a cycloalkyl radical; m and n each is an integer of from zero to 4.

4,540,654

METHOD OF FORMING COLOR IMAGE COMPRISING HETEROCYCLIC MAGENTA DYE-FORMING COUPLER

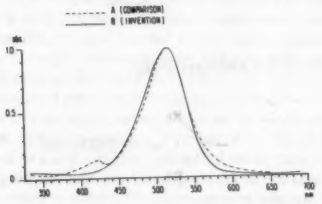
Tadahisa Sato; Toshio Kawagishi, and Nobuo Furutachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 19, 1984, Ser. No. 590,818

Claims priority, application Japan, Mar. 18, 1983, 58-45512

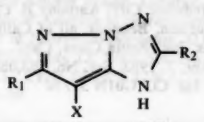
Int. Cl.[3] G03C *7/00, 1/40, 7/40*

U.S. Cl. 430—381 **24 Claims**



1. A method of forming a color image comprising developing a silver halide photographic light-sensitive material with a developing solution containing an aromatic primary amine in the presence of a coupler represented by general formula (I) and/or a polymer coupler having a repeating unit derived from

a vinyl monomer containing a part represented by general formula (I) in its molecule:



(I)

wherein R_1 and R_2 are independently a hydrogen atom or a substituent; and X is a hydrogen atom or a group capable of being released upon coupling.

4,540,655

METHOD OF PROCESSING A DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yoshihiro Takagi; Shigeo Hirano, and Tadao Sugimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 428,514, Sep. 29, 1982, abandoned. This application Oct. 11, 1984, Ser. No. 660,241

Claims priority, application Japan, Sep. 29, 1981, 56-154116

Int. Cl.³ G03C *5/24*

U.S. Cl. 430—410 **34 Claims**

1. A method of processing a direct positive silver halide light-sensitive material which contains an internal latent image type silver halide emulsion layer, comprising the steps of:

providing a direct positive silver halide photographic light-sensitive material comprising a support having coated thereon a hydrophilic colloid layer containing a fogging compound represented by the following general formula (I):

$$R^1NHNHCOR^2 \quad (I)$$

wherein R^1 represents an unsubstituted or substituted aryl group or an unsubstituted or substituted alkyl group; and R^2 represents a hydrogen atom, an unsubstituted or substituted aryl group or an unsubstituted or substituted alkyl group;

imagewise exposing the material to light;

developing the exposed material in a developing solution containng 25 g/l or more of hydroquinone, the developing solution having a pH of from 11.0 to 13.0.

4,540,656

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Toyoki Nishizima; Masao Sasaki, and Kaoru Onodera, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 27, 1983, Ser. No. 499,315

Claims priority, application Japan, Jun. 1, 1982, 57-93323

Int. Cl.³ G03C *1/46*

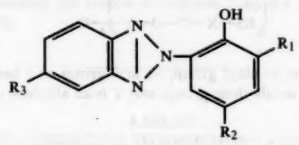
U.S. Cl. 430—505 **11 Claims**

1. A color photographic light-sensitive material comprising, on a reflective support,

(a) at least one light-sensitive silver halide emulsion layer, a cyan dye forming coupler being present in the light-sensitive silver halide emulsion layer if said material comprises only one emulsion layer or, if said material comprises more than one emulsion layer, said cyan dye-forming coupler being present in the emulsion layer located furthest from the support,

(b) a non-light-sensitive layer provided on the opposite side, relative to the support, either of the light-sensitive silver halide emulsion layer containing the cyan dye-forming coupler if said material contains only one emulsion layer or, if said material contains more than one emulsion layer, of the light-sensitive silver halide emulsion layer containing the cyan dye-forming coupler located furthest from said reflective support, said non-light-sensitive layer containing;

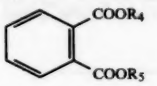
(i) a benzotriazole derivative represented by the following Formula (I):



wherein R_1 and R_2 independently represent an alkyl, an alkoxy, an alkenyl, each alkyl, alkoxy, or alkenyl having not less than 4 carbon atoms, an aryl, or an aryloxy, said aryl and aryloxy each being substituted or unsubstituted and wherein R_3 represents hydrogen, a halogen, an alkyl, an alkoxy, an alkenyl, each alkyl, alkoxy, or alkenyl having not less than 4 carbon atoms, an aryl, or an aryloxy; and

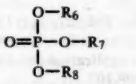
(ii) at least one compound selected from the group consisting of compounds of the formulae (II) and (III):

Formula (II)



wherein R_4 and R_5 independently represent an alkyl having not less than 5 carbon atoms, an aryl, or an aralkyl, said aryl and aryloxy each being substituted or unsubstituted;

Formula (III)



wherein R_6, R_7 and R_8 independently represent an alkyl having not less than 5 carbon atoms.

4,540,657

PHOTOGRAPHIC COUPLER SOLVENTS AND PHOTOGRAPHIC ELEMENTS EMPLOYING SAME

Sundaram Krishnamurthy, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 6, 1984, Ser. No. 617,782

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—546 **12 Claims**

1. A photographic element comprising a support having thereon at least one silver halide emulsion layer having associated therewith a dye-forming coupler dispersed in a nonpolymeric coupler solvent therefor which has at least one terminal epoxy group and at least one ester or amide group.

4,540,658

SILVER HALIDE COLOR PHOTOGRAPHIC PRODUCTS

Masao Sasaki, and Kaoru Onodera, both of Odawara, Japan, assignors to Konishiroku Photo Industry Co. Ltd., Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,588

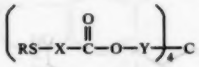
Claims priority, application Japan, Jun. 29, 1982, 57-113486; Jun. 29, 1982, 57-113487

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—551 **19 Claims**

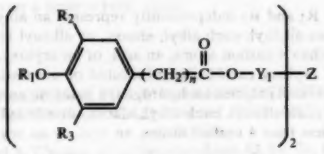
1. A silver halide color photographic product having at least one dye image forming layer on a support, which further contains at least one of the compounds of formula (I) or (II) in

said dye image forming layer and/or an adjoining or an adjacent layer:



(I)

wherein R is an alkyl group, an aryl group or a heterocyclic group; X is an alkylene group; and Y is an alkylene or arylene group; and



(II)

wherein R_1 is a hydrogen atom, an alkyl group or an aryl group; R_2 and R_3 are each an alkyl group; Y_1 is an alkylene or arylene group; Z is an oxygen atom, a sulfur atom, a sulfonyl group, a carbonyl group or an alkylene group; and n is an integer of 1 to 20.

4,540,659

SIMULTANEOUS CALIBRATION HETEROGENEOUS IMMUNOASSAY

David J. Litman, Mountain View, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 255,022, Apr. 17, 1981, Pat. No. 4,391,904, which is a continuation of Ser. No. 106,620, Dec. 26, 1979, Pat. No. 4,299,916. This application Jul. 16, 1982, Ser. No. 399,107

Int. Cl.³ G01N *33/54*; C12N *9/96*

U.S. Cl. 435—7 **4 Claims**

1. In a method for determining the presence in a sample of an analyte, which analyte is a member of a specific binding pair ("mip") consisting of ligand and receptor ("antiligand"),

said method employing a signal producing system having at least two enzymes, including one enzyme bound to a mip ("enzyme-bound-mip"), and a solute dye precursor which is catalytically transformed to an insoluble dye by one of said enzymes bound to a mip-containing measurement first surface, said insoluble dye producing a change in a detectable signal at said first surface in proportion to the amount of analyte, where said mip at said first surface provides for binding of enzyme-bound-mip through mip complex formation to said first surface, and contacting of said first surface with said sample and said enzyme-bound-mip results in binding of said enzyme-bound-mip to said first surface in proportion to the amount of analyte in said sample,

the improvement which comprises:

during said contacting, having adjacent to said first surface, a calibration second surface to which anti-enzyme receptor is bound in a predetermined amount and to which enzyme of said enzyme-bound-mip becomes bound through mip complex formation in an amount which provides substantially predetermined ratios to the amount of enzyme-bound-mip bound to said first surface, whereby the ratio of the change in signal at said second surface to the change in signal at said first surface defines the amount of analyte in said sample substantially independent of non-specific factors.

4,540,660

SUBSTRATE FOR FLUOROIMMUNOASSAY OF BIOLOGICAL FLUIDS

Richard A. Harte, Redwood City; Anthony B. Chen, Hayward, and Nancy K. Kaufman, Belmont, all of Calif., assignors to Daryl Laboratories, Inc., Santa Clara, Calif.

Filed Apr. 7, 1983, Ser. No. 483,055

Int. Cl.³ G01N *33/54*

U.S. Cl. 435—7 **15 Claims**

1. Substrate for fluoroimmunoassay comprising:

(1) swellable, rehydratable protein binding matrix forming a three-dimensional polymeric matrix;

(2) first particulate light scattering centers distributed in the polymeric matrix which scatter visible light; and

(3) second particulate light scattering centers distributed in the polymeric matrix which reflect fluorescent excitation light of a particular wavelength or frequency and absorb all other light.

4,540,661

COMPOSITION OF MATTER AND PROCESS

Betty R. Hannon, Kalamazoo Township, Kalamazoo County; Fritz Reusser, Portage; Lester A. Dolak, Cooper Township, Kalamazoo County; Alexander D. Argoudelis, Portage, and Thomas M. Castle, Cooper Township, Kalamazoo County, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 24, 1983, Ser. No. 469,375

Int. Cl.³ C12P *39/00, 13/00*; C12N *1/20*; C12R *1/05, 1/465*

U.S. Cl. 435—42 **6 Claims**

5. A process for enhancing the fermentation production of antibiotic 2-nitrosohydroxyl-amino-1-propanol by Alcaligenes sp., NRRL B-15269, which comprises fermentating said Alcaligenes s. in the presence of *Streptomyces plicatus* strain 395, NRRL 15273.

4,540,662

SEMISYNTHETIC MACROLIDIC ANTIBIOTICS, INTERMEDIATE COMPOUNDS FOR THEIR PREPARATION AND RELATED PHARMACEUTICAL COMPOSITIONS CONTAINING COMPOUNDS FOR THEIR PREPARATION AND RELATED PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Luciano Toscano, Milan, Italy, and Leonard M. Cappelletti, Fayetteville, N.Y., assignors to Pierrel S.p.A., Naples, Italy

Division of Ser. No. 338,105, Jan. 8, 1982, Pat. No. 4,439,429. This application Jan. 16, 1984, Ser. No. 570,833

Claims priority, application Italy, Jan. 9, 1981, 19082 A/81; Nov. 27, 1981, 25344 A/81; Nov. 27, 1981, 25346 A/81

Int. Cl.³ C12P *19/44*; C12N *15/00, 1/20*; C12R *1/48*

U.S. Cl. 435—74 **20 Claims**

1. A biologically pure culture of *Streptomyces erythreus* ATCC 31772, useful for microbiological processes for the preparation of antibiotics and blocked in the erythromycin synthesis.

4,540,663

LIQUEFACTION OF STARCH

Paul R. Witt, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Filed May 20, 1983, Ser. No. 496,444

Int. Cl.³ C12P *19/14*

U.S. Cl. 435—99 **9 Claims**

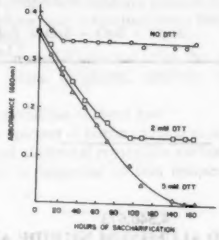
1. A process of treating a starch paste which comprises treating a starch paste with a fungal amylase at a temperature in the range of from about 75° C. to 80° C. for a period sufficient to effect reduction of the viscosity of the starch paste without significant increase in the dextrose equivalent value of the paste.

4,540,664

METHOD OF SACCHARIFYING CELLULOSE

Eric A. Johnson, Brookline; Arnold L. Demain, Wellesley, both of Mass., and Ashwin Madia, Decatur, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 13, 1983, Ser. No. 494,482
Int. Cl.[3] C12P 19/14; C12N 1/22; C12R 1/145
U.S. Cl. 435—99 16 Claims



1. A method of saccharifying cellulose comprising:
incubating said cellulose in an incubation mixture with a substantially cell-free cellulase-containing broth from *Clostridium thermocellum* and a quantity of a reducing agent sufficient to allow saccharification.

4,540,665

PROCESS FOR PRODUCING D-β-HYDROXYALKANOIC ACID

Junzo Hasegawa, Akashi; Masahiro Ogura, Ono; Hiroshi Kanema, Takasago; Hajime Kawaharada, Kakogawa, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 15, 1983, Ser. No. 475,603
Claims priority, application Japan, Mar. 16, 1982, 57-42361; Jun. 21, 1982, 57-107485; Jun. 21, 1982, 57-107486
Int. Cl.[3] C12P 7/42, 1/02; C12N 15/00, 1/32, 1/14, 1/16; C12R 1/72
U.S. Cl. 435—146 14 Claims

1. A process for producing a D-β-hydroxyalkanoic acid which comprises subjecting a substrate selected from the group consisting of an alkanoic acid, a 2-alkenoic acid and a 1-alkanol aerobically in a liquid medium to the action of a mutant of a microorganism belonging to the genus Candida in the presence of a sufficient amount of a carbon source to supply energy necessary for a conversion reaction, thereby converting the substrate into the corresponding D-β-hydroxyalkanoic acid, said Candida mutant being substantially unable to decompose the D-β-hydroxyalkanoic acid, and recovering the produced D-β-hydroxyalkanoic acid from the liquid medium.

4,540,666

METHANE FERMENTATION

Yasuyuki Nukina, Sennan; Syunji Namikawa, Minou; Toshikazu Tomioka, Ibaragi; Takehiko Yamamoto, Izumi, and Susumu Oi, Suita, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Aug. 10, 1982, Ser. No. 407,273
Claims priority, application Japan, Aug. 13, 1981, 56-127604; Aug. 13, 1981, 56-127606; Aug. 13, 1981, 56-127607
Int. Cl.[3] C12P 39/00, 5/00, 5/02; C12N 1/20; C12R 1/01, 1/145
U.S. Cl. 435—167 10 Claims

1. A fermentation process comprising:
(a) inoculating a bacteria strain of the genus Methanobacterium in a fermentation media which comprises at least inorganic salts, carbon sources, nitrogen sources and micro-flora of methane fermentation which are capable of liquifying the carbon sources and convert the carbon sources to low molecular weight materials which are utilized by the bacteria strain for methane fermentation, said bacteria strain having all the identifying characteristics of strain ST-23 (FERM BR-44),
(b) maintaining the fermentation media at a temperature of 25° to 45° C. whereby methane is produced, and
(c) collecting the produced methane from the fermentation media.

4,540,667

FLUORESCENT SIDEROPHORE GENES

Cindy Orser; Joyce Loper, both of Berkeley; Nickolas Panopoulos, Oakland; Steven Lindow, Berkeley, and Milton N. Schroth, Orinda, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 12, 1982, Ser. No. 433,606
Int. Cl.[3] C12N 15/00, 1/20, 1/00; A01N 33/02; C05F 11/08
U.S. Cl. 435—172.3 9 Claims

1. A rhizosphere inhabiting bacterial microorganism having enhanced ability to produce a fluorescent siderophore capable of sequestering Fe^{+3} as a result of in vitro introduction into said microorganism, or into a parent of said microorganism, of a DNA sequence encoding for said siderophone which is expressed by a gene present in pS FL-1 (A.T.C.C. Accession No. 39206).

4,540,668

ALCOHOL OXIDASE FROM PICHIA-TYPE YEASTS

Thomas R. Hopkins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 45,715, Jun. 5, 1979, abandoned. This application Apr. 27, 1981, Ser. No. 258,177
Int. Cl.[3] C12N 9/04; C12Q 1/26; C12R 1/84
U.S. Cl. 435—190 16 Claims

1. A method comprising:
preparing an aqueous fluid containing a suspension of cells of a methanol utilizing microorganism of genus Pichia, said aqueous fluid having a cell density effective for crystallization of alcohol oxidase in a recovery range solution under suitable conditions of pH and ionic strength;
homogenizing said fluid containing a suspension of cells to produce a homogenate; and
removing suspended solids from the homogenate, thereby producing a solution containing soluble alcohol oxidase.

4,540,669

HERPES SIMPLEX TYPE I SUBUNIT VACCINE

Alexander U. Bertland, Lansdale, and George P. Lampson, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 186,365, Sep. 11, 1980, Pat. No. 4,317,811. This application Jul. 23, 1981, Ser. No. 285,162
The portion of the term of this patent subsequent to Mar. 2, 1999, has been disclaimed.
Int. Cl.[3] A61K 39/245
U.S. Cl. 435—235 1 Claim

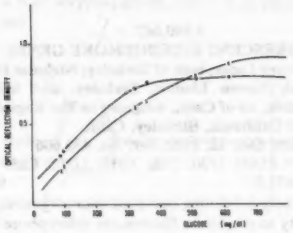
1. A herpes simplex type I immunogenic antigen having a molecular weight greater than 1×10^6 daltons and comprising about 5 or 6 bands having minimum molecular weight greater than 68,000 daltons, the antigen being substantially free of glycoprotein and of DNA, and containing from about 0.1 to about 0.7 μg carbohydrate per 1 μg of protein and containing one lipid band having a molecular weight between about 60,000 and about 70,000 daltons.

4,540,670

METHOD FOR MEASUREMENT OF LIQUID SAMPLES

Fuminori Arai, and Masao Kitajima, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 14, 1983, Ser. No. 466,256
Claims priority, application Japan, Feb. 12, 1982, 57-20968
Int. Cl.[3] G01N *21/78, 33/52*
U.S. Cl. 436—170 23 Claims



1. In a method for assaying an analyte comprising applying a liquid sample having a relatively high viscosity containing the analyte onto a spreading layer of a multilayer analysis element comprising a support having laminated thereon, in sequence, at least one reagent layer containing a substance capable of converting a detectable chemical species upon reaction with said analyte and a liquid sample-spreading layer and then detecting said detectable chemical species, the improvement which comprises applying a wetting liquid onto said spreading layer of the multilayer analysis element prior to applying said liquid sample to the multilayer analysis element, said liquid sample being applied to the multilayer analysis element while at least the surface of said spreading layer is maintained wet with said wetting liquid.

4,540,671

GLASS-CERAMIC PRODUCT

Kazuo Kondo, and Masahiko Okuyama, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nogoya, Japan

Filed Nov. 15, 1983, Ser. No. 552,190
Claims priority, application Japan, Nov. 15, 1982, 57-200020
Int. Cl.[3] C03C *3/22;* C03B *32/00;* C04B *33/34*
U.S. Cl. 501—9 8 Claims

1. A glass-ceramic product which is an electrically insulating ceramic material, shows relatively small permittivity and has a low coefficient of thermal expansion, said product being produced by the process comprising the steps of:

combining 0.1 to 6 wt% of a compound selected from the group consisting of B_2O_3 and P_2O_5 with a mixture consisting essentially of 54 to 63 wt% SiO_2, 20 to 28 wt% Al_2O_3, 10 to 18 wt% MgO and 2 to 6 wt% ZnO;

forming a glassy material from the combined compound and mixture;

grinding the glassy material to form a frit;

molding the frit;

firing the molded frit into a crystalline form.

4,540,672

GLASSES OF LOW DENSITY AND HIGH INDEX OF REFRACTION FOR OPHTHALMIC AND OPTICAL APPLICATIONS

Jean E. Boudot; Jean P. Mazeau, and Michel Prassas, all of Avon, France, assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 607,517, May 7, 1984, abandoned. This application Jul. 30, 1984, Ser. No. 635,493
Claims priority, application France, Aug. 2, 1983, 83 12693
Int. Cl.[3] C03C *3/08*
U.S. Cl. 501—65 4 Claims

1. A glass for ophthalmic and optical use having a refractive index between about 1.595–1.607, a density less than or equal to about 2.65 g/cm^3, and an Abbe number between about 40–47, consisting essentially, in weight percent on the oxide basis, of:

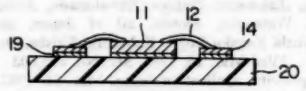
SiO_2	50–55	$Li_2O + Na_2O + K_2O$	17–23
B_2O_3	7.5–12	CaO	0–8
Al_2O_3	0–2	ZrO_2	0–3
Li_2O	2–7.5	TiO_2	9.5–17
Na_2O	1–4	$CaO + ZrO_2 + TiO_2$	15–22
K_2O	>10–16	As_2O_3	0–0.6
		$MgO + BaO + SrO + ZnO + La_2O_3$	0

4,540,673

SINTERED ALUMINUM NITRIDE AND SEMI-CONDUCTOR DEVICE USING THE SAME

Yukio Takeda; Satoru Ogihara; Mitsuru Ura; Kousuke Nakamura, all of Hitachi; Tadamichi Asai, Ibaraki; Tokio Ohkoshi, Hitachi; Yasuo Matsushita, Hitachi, and Kunihiro Maeda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,150
Claims priority, application Japan, Apr. 30, 1981, 56-66376
Int. Cl.[3] C04B *35/58*
U.S. Cl. 501—96 11 Claims



1. Sintered aluminum nitride having a thermal conductivity at room temperature of 0.2 cal/cm.sec.°C. or higher, which consists essentially of at least 65% by weight of aluminum nitride and at least one of beryllium, beryllium compound, lithium and lithium compound.

4,540,674

SILICON NITRIDE COMPOSITE REFRACTORIES

Akira Watanabe, Okayama; Yoshimitsu Takeuchi, Bizen; Noboru Shinoda, Bizen; Tetsusaburo Isono, Bizen, and Kenji Fujiwara, Bizen, all of Japan, assignors to Kyushu Refractories Co., Ltd., Bizen, Japan

Filed Aug. 11, 1983, Ser. No. 522,650
Claims priority, application Japan, Feb. 8, 1983, 58-20407
Int. Cl.[3] C04B *35/58, 35/56, 35/04, 35/10*
U.S. Cl. 501—97 7 Claims

1. Silicon nitride composite refractories consisting of:

20 to 60 wt% silicon nitride;

10 to 50 wt% refractory materials in powder form selected from the group consisting of magnesia, spinel, alumina, zirconia and carbides, said refractory materials having grain sizes of 50 microns or more, and

1 to 30 wt% boron nitride,

said composite refractories containing silicon nitride bonds formed by the reaction sintering of silicon, said silicon nitride bonds being bonded structures.

4,540,675

CARBON-CONTAINING REFRACTORIES WITH SUPERIOR EROSION AND OXIDATION RESISTANCE

Martin Morris, Imperial, and Mark K. Fishler, Pittsburgh, both of Pa., assignors to Vesuvius Crucible Company, Pittsburgh, Pa.

Filed May 2, 1983, Ser. No. 490,506
Int. Cl.[3] C04B *35/54, 35/56*
U.S. Cl. 501—99 23 Claims

1. A refractory body for controlling the flow of a molten steel stream having a temperature greater than 1400° C. during continuous casting, said refractory body formed of the composition comprising:

a refractory material selected from the group consisting of alumina, silica, magnesia, zirconia, zircon and silicon carbide;

elemental crystalline carbon; and

an effective amount of boron carbide to reduce the oxidation rate of said elemental crystalline carbon when said refractory body is subjected to said temperature greater than 1400° C.

4,540,676

LOW TEMPERATURE FIRED DIELECTRIC CERAMIC COMPOSITION WITH FLAT TC CHARACTERISTIC AND METHOD OF MAKING

Mike S. H. Chu; Charles E. Hodgkins, both of Lewiston, and Daniel C. Rose, Ransomville, all of N.Y., assignors to TAM Ceramics, Niagara Falls, N.Y.

Filed May 23, 1984, Ser. No. 613,250
Int. Cl.[3] C04B *35/46*
U.S. Cl. 501—138 15 Claims

11. A dielectric ceramic composition having a dielectric constant greater than 2400, said composition consisting essentially of from about 91.6 to about 95.5 weight percent barium titanate, from about 0.91 to about 1.49 weight percent niobium pentoxide, from about 0.18 to about 0.31 weight percent cobalt oxide, from about 1.04 to about 1.87 weight percent bismuth trioxide, from about 0.68 to about 1.23 weight percent titanium dioxide, from about 0.67 to about 1.20 weight percent lead oxide, from about 0.26 to about 0.46 weight percent boron oxide, from about 0.82 to about 1.49 weight percent zinc oxide, and from 0 to about 0.11 weight percent manganese dioxide, wherein the capacitance of said composition varies with temperature about 15 percent or less from the capacitance at 25° C. at temperatures between about −55° C. and about 125° C.

4,540,677

PROCESS FOR PRODUCING A POWER COMPOSITION FOR PRODUCING SINTERED CERAMIC ARTICLES

Ryo Enomoto, and Kiyotaka Tsukada, both of Oogaki, Japan, assignors to Ibiden Kabushiki Kaisha, Oogaki, Japan

Division of Ser. No. 516,760, Jul. 25, 1983, Pat. No. 4,485,182.
This application Sep. 27, 1984, Ser. No. 656,161
Claims priority, application Japan, Jul. 28, 1982, 57-130416; Sep. 28, 1982, 57-167499
Int. Cl.[3] C04B *35/00*
U.S. Cl. 501—151 10 Claims

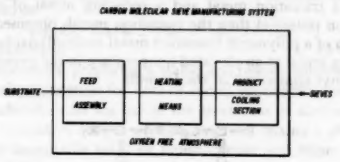
1. A process for producing a powder composition for producing sintered ceramic, which comprises supplying 100 parts by weight of a ceramic powder composed of one or more components and 0.5 to 15 parts by weight of a fluororesin to a liquid dispersion medium so that the volume ratio of solid matter consisting of said ceramic powder and fluororesin in the suspension will be within the range from 5 to 501, subjecting the mixture to a uniform dispersion treatment by adding a dispersant, giving to said suspension a pressure difference enough to overcome the stagnation of a sieving action due to a pressure less caused between the portions of the suspension on the fore and the rear sides of the sieve, passing the suspension through a sieve having a mesh size of 65 μm or less by giving vibrations to the suspension, and after the sieving treatment making the suspension into grannules having a powder bulk density equivalent to 5 to 46% of the theoretical value, and an average particle size within the range from 0.02 to 0.8 mm.

4,540,678

CARBON MOLECULAR SIEVES AND A PROCESS FOR THEIR PREPARATION AND USE

Robert F. Sutt, Jr., Johnstown, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 415,103, Sep. 7, 1982, abandoned. This application Dec. 13, 1983, Ser. No. 561,012
Int. Cl.[3] B01J *20/20;* C01B *31/08, 31/10;* B01D *53/02*
U.S. Cl. 502—5 13 Claims



1. A process for the continuous manufacturing of carbon molecular sieves having average effective pore diameters of from 2 to 15 Angstroms and an oxygen/nitrogen selectivity ratio of from 5.0 to 8.5 which comprises continuously feeding a charred naturally occurring substrate to a transport means for heating said substrate and heating said substrate at a maximum oxygen content of 500 ppm under non-activation conditions, without the use of an externally added pore blocking substance, at a temperature range of about 900° F. (482° C.) to 2000° F. (1093° C.) for a time period of about 5 to 90 minutes.

5. The process of claim 1, wherein said heating means is an electrically powered, infrared heated continuous transport type furnace.

12. A carbon molecular sieve, useful for separating gas or liquid mixtures containing components of at least two different molecular diameters, molecular weights or molecular shapes which has the following physical characteristics:

(a) an apparent density of from 0.60 to 0.70 g/cc,

(b) an oxygen diffusivity ($\times 10^{-8}$) of from 500 to 900 cm^2/sec,

(c) an oxygen/nitrogen selectivity ratio of from 5.0 to 8.5

(d) an oxygen capacity of from 4.00 to 6.00 cc/cc, and

(e) an average effective pore diameter of about 3 to 5 Angstroms.

4,540,679

MAGNESIUM HYDROCARBYL CARBONATE SUPPORTS

Gregory G. Arzoumanidis, Naperville, and Sam S. Lee, Hoffman Estates, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 23, 1984, Ser. No. 592,910
Int. Cl.[3] C08F *4/64, 4/02*
U.S. Cl. 502—111 32 Claims

9. The process of preparing a composition comprising a transition metal component and a magnesium hydrocarbyl carbonate support which comprises the steps of reacting a suspension comprising magnesium alcoholate with carbon dioxide to form a magnesium hydrocarbyl carbonate and reacting said magnesium hydrocarbyl carbonate with a transition metal component.

11. The process of claim 9 wherein the suspension comprises an alcohol.

4,540,680

INTERMETALLIC COMPOUNDS OF POLYMERIC TRANSITION METAL OXIDE ALKOXIDES AND CATALYTIC USE THEREOF

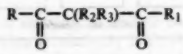
Anthony N. Speca, Kingwood, Tex., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 209,223, Nov. 24, 1980, abandoned, Ser. No. 209,224, Nov. 24, 1980, abandoned, Ser. No. 209,225, Nov. 24, 1980, abandoned, Ser. No. 209,226, Nov. 24, 1980, abandoned, Ser. No. 209,227, Nov. 24, 1980, abandoned, Ser. No. 209,228, Nov. 24, 1980, abandoned, Ser. No. 209,229, Nov. 24, 1980, abandoned, Ser. No. 228,831, Jan. 27, 1981, abandoned, and Ser. No. 483,054, Apr. 7, 1983, Pat. No. 4,513,095. This application Feb. 8, 1984, Ser. No. 578,244

Int. Cl.[3] C08F *4/64*

U.S. Cl. 502—119 23 Claims

1. An intermetallic compound comprising the reaction product of a transition metal and a reducing metal of a higher oxidation potential than the transition metal, obtained by the reaction of a polymeric transition metal oxide alkoxide and the reducing metal at an elevated temperature in the presence of a dicarbonyl compound of the formula



wherein R is alkyl containing up to 10 carbon atoms; R_1 is alkyl continuing up to 10 carbon atoms or $(CH_2)_mCO_2$—(lower) alkyl wherein m=0, 1 or 2; R_2 and R_3 are each hydrogen or lower alkyl; and R and R_1 taken together with the carbons to which they are attached form a ring of from 5 to about 8 ring carbon atoms.

13. A catalyst component for polymerization of alpha olefins comprising the intermetallic compound of claims **1**, **6** or **9**, further reacted with a halide activator selected from the group consisting of alkyl aluminum halides, silicon halides, alkyl silicon halides, titanium halides, boron halides and alkyl boron halides.

15. A catalyst system for the polymerization of alpha olefins comprising the catalyst component of claim **13** and an organo aluminum compound.

4,540,681

CATALYST FOR THE METHANATION OF CARBON MONOXIDE IN SOUR GAS

William A. Kustes, and Arthur L. Hausberger, both of Louisville, Ky., assignors to United Catalysts, Inc., Louisville, Ky.

Continuation of Ser. No. 177,165, Aug. 18, 1980, abandoned. This application May 28, 1982, Ser. No. 382,984

Int. Cl.[3] B01J *21/14, 23/76, 21/00*

U.S. Cl. 502—234 8 Claims

1. A sulfactive and selective methanation catalyst, having the property of inhibiting the deposition of carbon under normal carbonforming conditions at low steam/gas ratios of less than 0.320:1, the property of selectively promoting the conversion of carbon oxides to methane to the substantial exclusion of converting carbon monoxide to carbon dioxide at low steam/-gas ratios, and the property of actively and selectively converting carbon oxides to methane in the presence of sulfur compounds at temperatures in excess of 1000° F. but less than 1250° F., which comprises:

A. the oxides and sulfides of nickel and chromium in intimate combination with a compound selected from the group consisting of the aluminates or silicates of magnesia;

1. the nickel and chromium components, expressed as the oxides, comprising a major proportion of the total weight of the finished catalyst;

2. the aluminates or silicates of magnesia comprising a minor proportion of the total weight of the finished catalyst;

B. said catalyst having a surface area, before being placed onstream, in excess of 100 m^2/gm; and in which

C. the steps of catalyst preparation having included coprecipitation of insoluble compounds of nickel, chromium, magnesium, and aluminum or silicon from aqueous solutions of soluble salts of said metals.

4,540,682

PHARMACEUTICAL PEPTIDES, PREPARATION, USE AND INTERMEDIATES

George W. Hardy, Biggin Hill; Lawrence A. Lowe, Swanley, and Terence W. Smith, Orpington, all of United Kingdom, assignors to Burroughs Wellcome Co., Triangle Park, N.C.

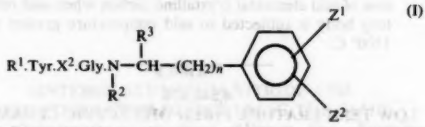
Filed May 23, 1984, Ser. No. 613,868

Claims priority, application United Kingdom, May 26, 1983, 8314646

Int. Cl.[3] A61K *37/00*; C07C *103/52*

U.S. Cl. 514—18 42 Claims

1. A peptide of formula (I)



(I)

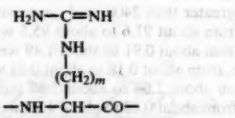
or a salt thereof wherein

R^1 is hydrogen, alkyl of 1 or 2 carbon atoms or an amidino group,

R^2 is alkyl of 1 or 2 carbon atoms,

R^3 is hydrogen or carbamyl,

X^2 is a D-radical having the structure:



Z^1 and Z^2 are the same or different and each is hydrogen, halo, nitro or trifluoromethyl and at least one is other than hydrogen,

m is 3 or 4 and

n is 0, 1 or 2,

provided that when R^3 is carbamyl then n is always 1.

4,540,683

IN VITRO AND IN VIVO TREATMENT OF CANCER CELLS AND TREATMENT OF VIRUSES WITH A TRIPEPTIDE COMPOUND

Augusto DeBarbieri, Milan, Italy, and Julius G. Bekesi, Teaneck, N.J., assignors to Proter S.p.A., Opera, Italy

Continuation-in-part of Ser. No. 468,036, Feb. 23, 1983, which is a continuation-in-part of Ser. No. 455,477, Jan. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 311,646, Oct. 15, 1981, Pat. No. 4,428,875, which is a continuation-in-part of Ser. No. 173,621, Jul. 30, 1980, Pat. No. 4,314,999, which is a continuation-in-part of Ser. No. 929,237, Jul. 31, 1978, Pat. No. 4,216,208. This application Jun. 18, 1984, Ser. No. 621,796

Int. Cl.[3] A61K *37/02*

U.S. Cl. 514—18 22 Claims

1. A method of interfering with virus replication comprising: exposing a soft tissue oncogenic virus to a therapeutically effective dose of a tripeptide compound selected from the group:

(1) 3-(p-fluorophenyl)-L-alanyl-3-[m-bis(2-chloroethyl-)aminophenyl]-L-alanyl-L-methionine

(2) 3-[m-bis(2-chloroethyl)aminophenyl]-L-alanyl-3-(p-fluorophenyl)-L-alanyl-L-methionine

(3) 3-(p-fluorophenyl)-L-alanyl-L-methionyl-3-[m-bis(2-chloroethyl)aminophenyl]-L-alanine

(4) 3-[m-bis(2-chloroethyl)aminophenyl]-L-alanyl-L-methionyl-3-(p-fluorophenyl)-L-alanine
(5) L-methionyl-3-(p-fluorophenyl)-L-alanyl-3-[m-bis(2-chloroethyl)aminophenyl]-L-alanine
(6) L-methionyl-3-[m-bis(2-chloroethyl)aminophenyl]-L-alanyl-3-(p-fluorophenyl)-L-alanine.

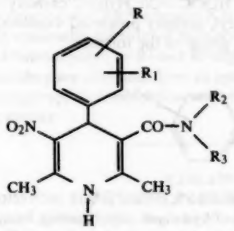
4,540,684

3-NITRO-5-AMIDE-1,4-DIHYDROPYRIDINES WITH POSITIVE INOTROPIC ACTIVITY

Jürgen Stoltefuss, Haan; Gerhard Franckowiak, Wuppertal; Horst Böshagen, Haan; Siegfried Goldmann, Wuppertal; Matthias Schramm, Cologne; Günter Thomas, and Rainer Gross, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

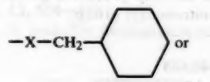
Filed May 18, 1984, Ser. No. 612,093
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319956
Int. Cl.[3] **C07D** *211/98, 405/12;* **A61K** *31/70, 31/455*
U.S. Cl. 514—32 **13 Claims**

1. A 1,4-dihydropyridine derivative of the formula

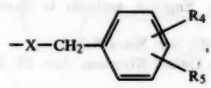


in which

R and R_1 each independently is hydrogen, C_1–C_4-alkyl, C_1 to C_{12}-alkoxy, C_1–C_4-halogenoalkoxy, halogen, nitro, trifluoromethyl,



or



X is oxygen or sulphur,

R_4 and R_5 each independently is hydrogen, C_1–C_4-alkyl, C_1–C_6-alkoxy, halogen, trifluoromethyl, amino or nitro, and

R_2 and R_3 each independently is hydrogen, a C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl or C_3–C_{10}-alkinyl radical which is optionally substituted by halogen, hydroxyl, C_1–C_4-alkoxy, amino, mono- and di-C_1–C_4-alkylamino, carbo-C_1–C_6-alkoxy and/or nitro, a C_3 to C_6-membered cycloalkyl radical, a phenyl radical which is optionally substituted by C_1–C_4-alkyl, C_1–C_6-alkoxy, halogen, amino and/or nitro, or a phenyl-C_1–C_3-alkyl radical, or a monosaccharide or 1-deoxynojirimycin radical which is optionally bonded via a C_1–C_8-alkyl chain to the amide nitrogen atom,

or a pharmaceutically acceptable acid addition salt thereof, which exhibits positive inotropic activity.

9. A pharmaceutical composition comprising a pharmaceutically acceptable diluent and an amount of a compound or salt according to claim 1 effective to improve the contractility of the heart, to raise the blood pressure, to lower the blood sugar, to reduce the swelling of mucous membranes, and to affect the salt and/or fluid balance.

4,540,685

PROCESS FOR THE PRODUCTION OF READILY SOLUBLE 5-AMINOSALICYLIC ACID PREPARATIONS, COMPOSITIONS AND METHODS OF USE

Kurt H. Bauer, Hermann-Herder-Strasse 9, 7800 Freiburg, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,975
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151196
Int. Cl.[3] **A61K** *31/60, 31/61, 31/605*
U.S. Cl. 514—162 **12 Claims**

1. A process for preparing a stable and readily soluble pharmaceutical preparation for oral or rectal application based on 5-aminosalicylic acid for use in the treatment of Crohn's disease and ulcerative colitus which comprises mixing a pharmaceutically acceptable solid or liquid carrier and either a dry mixture of 5-aminosalicylic acid and a pharmaceutically acceptable alkaline material, or a dry salt of 5-aminosalicylic acid and a pharmaceutically acceptable organic alkaline material, said pharmaceutically acceptable alkaline material or organic alkaline material giving a pH of 8–12 in a 1.0% aqueous solution and the concentration of acceptable alkaline material in the dry mixture being 0.5–3.0 mols per mol of 5-aminosalicylic acid.

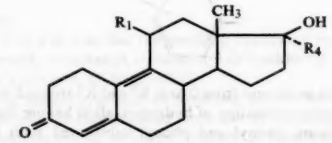
4,540,686

3-KETO-19-NOR-$\Delta^{4,9}$-STEROIDS

Daniel Philibert, La Varenne Saint-Hilaire; Jean G. Teutsch, Pantin; Germain Costerousse, Saint-Maurice, and Roger Deraedt, Pavillons-Sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Continuation of Ser. No. 469,042, Feb. 23, 1983, Pat. No. 4,477,445. This application Jun. 8, 1984, Ser. No. 618,590
Claims priority, application France, Mar. 1, 1982, 82 03338
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.[3] **C07J** *17/00;* **A61K** *31/58*
U.S. Cl. 514—179 **20 Claims**

1. A compound of the formula



wherein R_1 is phenyl optionally substituted with at least one member of the group consisting of chlorine, fluorine, methylthio, methylsulfonyl, methoxy, hydroxy and allyloxy and R_4 is selected from the group consisting of ethynyl and propynyl with the proviso that when R_4 is ethynyl, R_1 is not phenyl or phenyl substituted with fluorine or methoxy.

8. A method of inducing antiprogestomimetic activity in warm-blooded animals comprising administering to warm-blooded animals an antiprogestiomimetically effective amount of at least one compound of claim 1.

4,540,687

ANTIBACTERIAL 6'-(2-AMINO-2-[4-ACYLOXYPHENYL]ACETAMIDO)-PENICILLANOYLOXYMETHYL PENICILLANATE 1,1-DIOXIDE COMPOUNDS

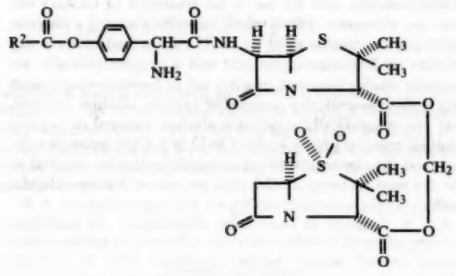
Michael S. Kellogg, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 300,421, Sep. 9, 1981, abandoned. This application Aug. 12, 1982, Ser. No. 407,540

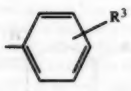
Int. Cl.[3] **A61K** *31/43;* **C07D** *499/32*

U.S. Cl. 514—193 **16 Claims**

1. A compound of the formula



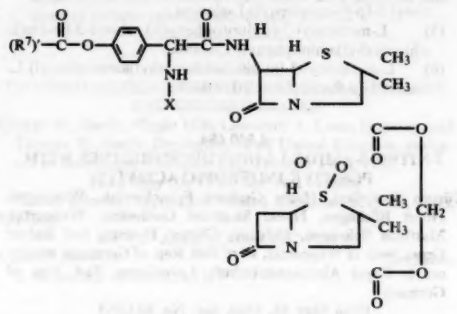
the pharmaceutically-acceptable acid addition salts thereof and the pharmaceutically-acceptable base salts thereof; wherein R^2 is selected from the group consisting of alkoxy having from one to six carbons, HOOC—$(CH_2)_n$—, HOOC—$C(CH_3)_2$—, 3-carboxycyclopentyl, 4-carboxycyclohexyl, R^8R^9N— and a group of the formula



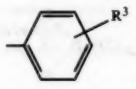
wherein n is an integer from 0 to 6; R^8 and R^9 are each selected from the group consisting of hydrogen, alkyl having from one to six carbons, phenyl and phenyl substituted with fluoro, chloro, bromo, iodo, alkyl having from one to four carbons or alkoxy having from one to four carbons, provided that R^8 and R^9 are not both hydrogen; and R^3 is selected from the group consisting of hydrogen, alkyl having one to four carbons, alkoxy having one to four carbons, fluoro, chloro, bromo, iodo and cyano.

13. A pharmaceutical composition, suitable for treating a bacterial infection in a mammalian subject, which comprises an antibacterially effective amount of a compound according to claim **1** and a pharmaceutically-acceptable carrier.

14. A compound of the formula



wherein X is selected from the group consisting of of 1-methyl-2-alkoxycarbonylvinyl having 1 to 3 carbons in said alkoxy moiety, benzyloxycarbonyl and 4-nitrobenzyloxycarbonyl; and $(R^7)'$is selected from the group consisting of alkoxy having from one to six carbons, carboxy protected HOOC—$(CH_2)_n$—, carboxy protected HOOC—$C(CH_3)_2$—, carboxy protected 3-carboxycyclopentyl, carboxy protected 4-carboxycyclohexyl, R^8R^9N— and a group of the formula



wherein n is an integer from 0 to 6; R^8 and R^9 are each selected from the group consisting of hydrogen, alkyl having from one to six carbons, phenyl and phenyl substituted with fluoro, chloro, bromo, iodo, alkyl having from one to four carbons or alkoxy having from one to four carbons, provided that R^8 and R^9 are not both hydrogen; and R^3 is selected from the group consisting of hydrogen, alkyl having one to four carbons, alkoxy having one to four carbons, fluoro, chloro, bromo, iodo and cyano; and wherein said carboxy protected groups are protected by a benzyl or a 4-nitrobenzyl group.

4,540,688

β-LACTAM ANTIBIOTICS

Michael J. Driver, Horsham, England, assignor to Beecham Group p.l.c., England

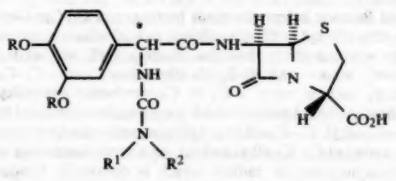
Filed Apr. 27, 1983, Ser. No. 489,183

Claims priority, application United Kingdom, Apr. 29, 1982, 8212525

Int. Cl.[3] **A61K** *31/43, 31/495;* **C07D** *499/54*

U.S. Cl. 514—196 **30 Claims**

1. A compound of the formula (I):

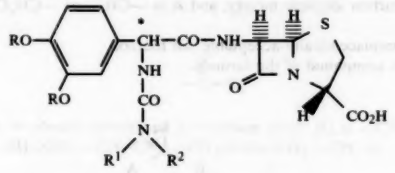


(I)

or a pharmaceutically acceptable salt or in-vivo hydrolyzable ester thereof wherein R is hydrogen, alkylcarbonyl of 1 to 6 carbon atoms in the alkyl moiety or alkyl of 1 to 6 carbon atoms; R^1 is hydrogen or a hydrocarbon; R^2 is hydrogen, or an optionally substituted hydrocarbon or optionally substituted heterocyclyl or CXR^d, wherein X is 0 or S and R^d is hydrogen

or an optionally substituted hydrocarbon or optionally substituted heterocyclyl; or R^1 and R^2 together with the nitrogen to which they are attached, for an optionally substituted heterocyclyl group.

7. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises and antibacterially effective amount of a compound of the formula (I):



(I)

or a pharmaceutically acceptable salt or in-vivo hydrolyzable ester thereof wherein R is hydrogen, alkylcarbonyl of 1 to 6 carbon atoms in the alkyl moiety or alkyl of 1 to 6 carbon atoms; R^1 is hydrogen or a hydrocarbon; R^2 is hydrogen, or an optionally substituted hydrocarbon or optionally substituted heterocyclyl or CXR^d, wherein X is O or S and R^d is hydrogen or an optionally substituted hydrocarbon or optionally substituted heterocyclyl; or R^1 and R^2 together with the nitrogen to which they are attached, form an optionally substituted heterocyclyl group, in combination with a pharmaceutically acceptable carrier.

4,540,689

PENICILLIN DERIVATIVE

Shigeaki Muto, Tokyo; Kouichi Niimura, Sayama; Takao Ando; Akihiko Kanno, both of Tokyo; Takao Furusho, Machida, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

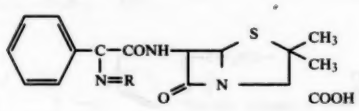
Filed Sep. 16, 1982, Ser. No. 418,760

Claims priority, application Japan, Sep. 22, 1981, 56-149869; Sep. 22, 1981, 56-149870

Int. Cl.[3] **A61K** *31/43, 31/44;* **C07D** *499/68, 499/70*

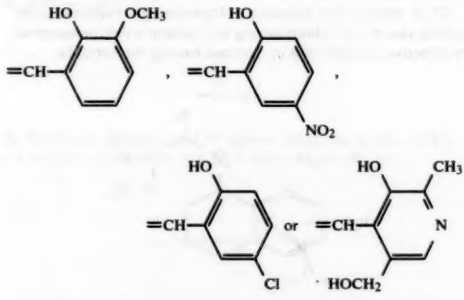
U.S. Cl. 514—196 **2 Claims**

1. A penicillin derivative represented by the formula (I):



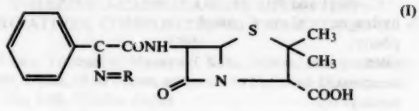
(I)

wherein R is



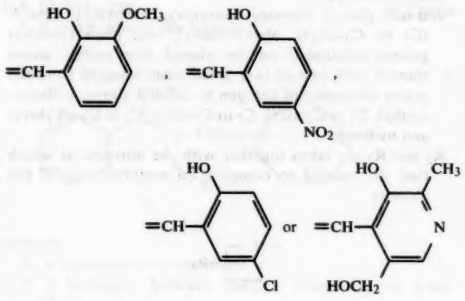
or a pharmaceutically acceptable salt thereof.

2. An antibacterial composition in dosage unit form comprising an effective amount of a penicillin derivative represented by the formula (I):



(I)

wherein R is



or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier therefor.

4,540,690

2-(PHENYLMETHYLENE)CYCLOALKYLAMINES AND -AZETIDINES

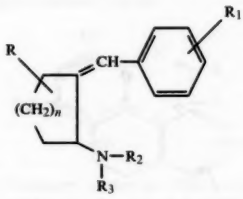
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 347,123, Feb. 9, 1982, abandoned. This application Aug. 16, 1982, Ser. No. 408,333

Int. Cl.[3] **C07D** *205/04, 405/08;* **A61K** *31/36, 31/395*

U.S. Cl. 514—210 **51 Claims**

1. A compound of the formula



(I)

wherein

n is 1, 2, 3 or 4 so that the resulting cycloalkyl ring is cyclopentyl, cyclohexyl, cycloheptyl or cyclooctyl;

R is hydrogen, C_1 to C_3-alkyl;

R_1 represents hydrogen or from one to two substituents on the phenyl ring selected from the group consisting of a halogen having an atomic number of from 9 to 35;

C_1 to C_4-alkyl,

trifluoromethyl,

hydroxy, carboxyl, and sodium and potassium salts thereof,

C_1 to C_2-alkyloxy,

(C_1 to C_2-alkyloxy)carbonyl (—C(O)O—C_1 to C_2-alkyl),

C_2 to C_5-alkanoyloxy (—OC(O)—C_1 to C_4-alkyl), hydroxymethyl,

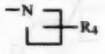
(C_1 to C_2-alkanoyl)oxymethyl (C_1 to C_2-alkanoyl-OCH_2),

—O—$(CH_2)_r$—O— bonded to the 3- and 4-ring carbons, where r is 1 or 2,

(C_1 to C_3-alkyl)oxymethyl (C_1 to C_3-alkyl-OCH_2),

(C_1 to C_2-alkyl)oxycarbonylmethyl, (C_1 to C_2-alkyl—O—C(O)—CH_2—),
—CH((R_{10})—C(O)—OR_{11} wherein R_{10} is hydrogen or C_1 to C_3-alkyl and R_{11}
is hydrogen or C_1 to C_3-alkyl,
phenyl,
phenoxy,
benzyloxy,
benzoyloxy,
phenyl-C_1 to C_3-alkyl,
phenylethenyl,
phenoxymethyl,
and such phenyl, phenoxy, benzyloxy, benzoyloxy, phenyl-(C_1 to C_3-alkyl), phenylethenyl, and phenoxymethyl groups substituted on the phenyl ring carbon atoms thereof with one or two substituents selected from the group consisting of halogen as defined above, trifluoromethyl, C_1 to C_2-alkyl, C_1 to C_2-alkyl, C_1 to C_2-alkyloxy, and hydroxy;

R_2 and R_3 are taken together with the nitrogen to which they are bonded to complete an azetidine ring of the formula



wherein R_4 denotes hydrogen, C_1 to C_2-alkyl, 3-hydroxy, 3-(C_1 to C_2-alkyloxy)- or 3-(C_1 to C_2-alkanoyloxy); and the acid addition salts of such compounds.

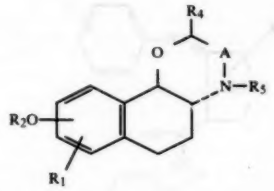
4,540,691

DOPAMINE AGONISTS AND USE THEREOF

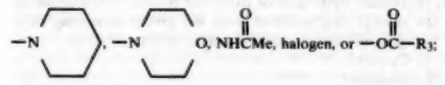
Alan S. Horn, Noordhorn, Netherlands, assignor to Nelson Research & Development Co., Irvine, Calif.

Filed Apr. 13, 1984, Ser. No. 600,008
Int. Cl.[3] **A61K** *31/535, 31/55;* **C07D** *265/36, 267/14*
U.S. Cl. 514—211 **25 Claims**

1. A compound of the formula:

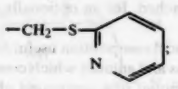


wherein: R_1 is H, OH, —OCH_3, —CH_2OH, —NH_2, —NHMe, —NHEt, —NMe_2, —NEt_2,



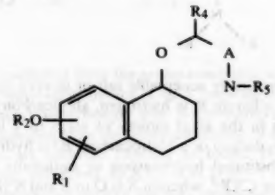
R_2 is H, —CH_3, or

R_3 is phenyl, benzyl, or 1–4 carbon alkyl; R_4 is —CH_2OH, —CH_2—CN, —CH_2—S—Me, —CH_2—S—CN, or

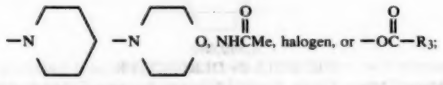


R_5 is H, 1–4 carbon alkyl, alkenyl, or alkynyl, or aralkyl having a 1–4 carbon alkylene moiety; and A is —CH_2—or —CH_2C-H_2—;
or a pharmaceutically-acceptable salt thereof.

13. A compound of the formula:

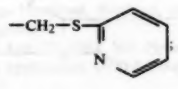


wherein: R_1 is H, OH, —OCH_3, —CH_2OH, —NH_2, —NHMe, —NHEt, —NMe_2, —NEt_2,



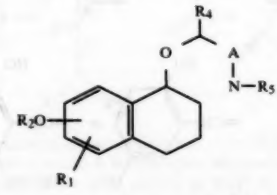
R_2 is H, —CH_3, or

R_3 is phenyl, benzyl, or 1–14 carbon alkyl; R_4 is H, —CH_3, —CH_2OH, —CH_2-CN, —CH_2-S-Me, —CH_2-S-CN, or

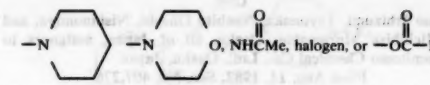


R_5 is 2-thienylethyl, or 3-thienylethyl; and A is —CH_2— or —CH_2CH_2—; or a pharmaceutically-acceptable salt thereof.

23. A method for inducing a dopaminergic response, comprising the step of administering to a patient a dopaminergically-effective amount of a compound having the formula:

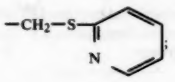


wherein: R_1 is H, OH, —OCH_3, —CH_2OH, —NH_2, —NHMe, —NHEt, —NMe_2, —NEt_2,



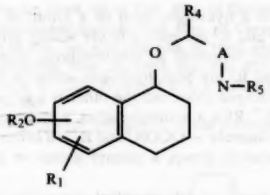
R_2 is H, $-CH_3$, or

R_3 is phenyl, benzyl, or 1–4 carbon alkyl; R_4 is $-CH_2OH$, $-CH_2$-CN, $-CH_2$-CN, $-CH_2$-S-Me, CH_2-S-CN, or

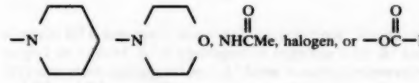


R_5 is H, 1–4 carbon alkyl, alkenyl, or alkynyl, or aralkyl having a 1–4 carbon alkylene moiety; and A is $-CH_2-$ or $-CH_2CH_2-$, and pharmaceutically-acceptable salts thereof.

25. A method for inducing a dopaminergic response, comprising the step of administering to a patient a dopaminergically-effective amount of a compound having the formula:

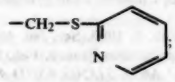


wherein: R_1 is H, OH, $-OCH_3$, $-CH_2OH$, $-NH_2$, $-NHMe$, $-NHEt$, $-NMe_2$, $-NEt_2$,



R_2 is H, $-CH_3$, or

R_3 is phenyl, benzyl, or 1–4 carbon alkyl; R_4 is H, $-CH_3$, $-CH_2OH$, $-CH_2$-CN, $-CH_2$-S-Me, CH_2-S-CN, or



R_5 is 2-thienylethyl, or 3-thienylethyl; and A is $-CH_2-$ or $-CH_2CH_2$-; or a pharmaceutically-acceptable salt thereof.

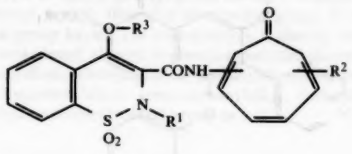
4,540,692

ANTI-INFLAMMATORY N-(1-OXO-2,4,6-CYCLOHEPTATRIENYL)2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE 1,1-DIOXIDE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE

Ikuo Ueda, Toyonaka; Masayuki Kato, Minoo, and Yoshiharu Kasai, Daito, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 14, 1984, Ser. No. 589,338
Claims priority, application Japan, Mar. 31, 1983, 58-57071
Int. Cl.[3] **A61K** *31/54;* **C07D** *279/02*
U.S. Cl. 514—225 **10 Claims**

1. A compound of the formula:



[I]

wherein

R^1 is hydrogen or lower alkyl,

R^2 is hydrogen, hydroxy, halogen, lower alkyl or lower alkoxy, and

R^3 is hydrogen or phenyl (lower) alkenoyl, and pharmaceutically acceptable salts thereof.

10. A method for treatment of inflammation, which comprises administering an anti-inflammatory effective amount of a compound of claim **1** to a human being or an animal.

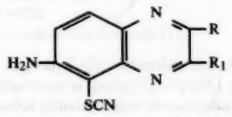
4,540,693

THIOCYANATOQUINOXALINE COMPOUNDS WITH IMMUNOMODULATING ACTIVITY

Robert J. Alaimo, Norwich, N.Y., assignor to Norwich Eaton Pharmaceuticals, Inc., New York, N.Y.

Filed Sep. 12, 1983, Ser. No. 531,320
Int. Cl.[3] **C07D** *241/46, 241/42, 405/14, 405/04*
U.S. Cl. 514—249 **11 Claims**

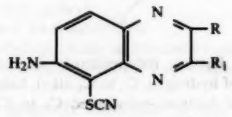
1. A compound of the formula:



(1)

wherein R is hydrogen, methyl or 5-thiocyanato-2-furanyl; R_1 is hydrogen, methyl or 2-furanyl; or R and R_1 taken together with the atoms to which they are attached form a cyclohexyl ring.

5. A method for mitigating the immunological incompetence of a host which comprises administering to a host in need of such treatment an effective amount of a pharmaceutical composition comprising a compound of the formula:



(1)

wherein R is hydrogen, methyl, or 5-thiocyanato-2-furanyl; R_1 is hydrogen, methyl or 2-furanyl; or R and R_1 taken together with the atoms to which they are attached form a cyclohexyl ring.

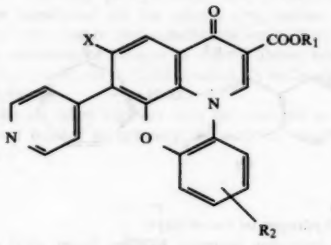
4,540,694

1-PYRIDINE SUBSTITUTED QUINO-BENOXAZINES AND ANTIBACTERIAL USE

Daniel T. Chu, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 26, 1984, Ser. No. 604,198
Int. Cl.³ A61K *31/535;* **C07D** *265/34*
U.S. Cl. 514—232 **11 Claims**

1. A compound having the formula:



wherein R_1 is hydrogen or a carboxy protecting group; x is halogen or hydrogen; R_2 is one or more groups seclected from the group consisting of hydrogen, halogen, methylenedioxy, C_1 to C_6 alkyl, halo-substituted C_1 to C_6 alkyl, hydroxy-substituted C_1 to C_6 alkyl, a group having the formula:

$$—Y—R_3$$

wherein —Y— is —O— or —S— and R_3 is hydrogen of C_1 to C_6 alkyl, and an amine group having the formula:

wherein R_4 and R_5 are independently hydrogen or C_1 to C_6 alkyl, wherein the 1-(4pyridyl) group is optionally substituted with one or more substituents independently selected from the group consisting of hydrogen, C_1 to C_6 alkyl, halogen, hydroxy, a group of the formula —Y—R_3 and an amine of the formula:

wherein R_{10} and R_{11} are independently selected from the group consisting of hydrogen, C_1 to C_6 alkyl, halo-substituted C to C_6 alkyl and hydroxy-substituted C_1 to C_6 alkyl, and pharmaceutically acceptable salts thereof.

11. A method of treating a bacterial infection in a patient comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound as defined in claim **1**.

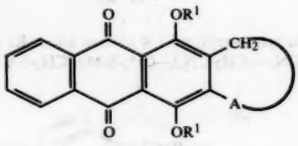
4,540,695

AMINONAPHTHACENE DERIVATIVES AND THEIR USE

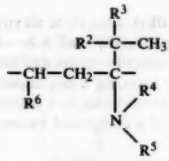
Kikuo Ishizumi, Toyonaka; Naohito Ohashi, Nishinomiya, and Michihisa Muramatsu, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Aug. 11, 1982, Ser. No. 407,278
Claims priority, application Japan, Aug. 12, 1981, 56-127227; May 10, 1982, 57-78708
Int. Cl.³ A61K *31/13;* **C07C** *97/07*
U.S. Cl. 514—239 **7 Claims**

1. A compound of the formula:



wherein A is the group:



wherein R^1 is a hydrogen atom or a group of the formula: —COR^7, R^2 and R^3 are each a lower alkoxy group or, when taken together, represent an ethylenedioxy group or an oxo group, R^4 and R^5 are both hydrogen atoms or either one of them is a hydrogen atom and the other is a group of the formula: —COR^7, R^6 is a hydrogen atom, a hydroxyl group or a group of the formula: —$OCOR^7$ and R^7 is a lower alkyl group, a halo(lower)alkyl group, a phenyl group or a halophenyl group.

7. An anti-tumor or anti-microbial composition which comprises an effective anti-tumor amount or effective anti-microbial amount of a compound of claim **1** as an active ingredient and a pharmaceutically acceptable carrier or diluent.

4,540,696

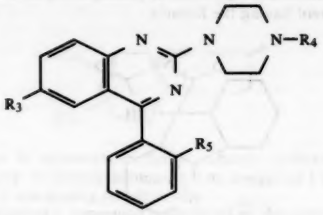
1-PIPERAZINYL 4-PHENYLQUINAZOLINE COMPOUNDS HAVING ANTIDEPRESSANT PROPERTIES AND DRUGS CONTAINING SAME

Kathleen Biziere, Clapiers; Andrë Hallot, Saint-Gely-du-Fesc, and Jean-Paul Kan, Clapiers, all of France, assignors to Sanofi S.A., France

Filed Feb. 3, 1983, Ser. No. 463,386
Claims priority, application France, Feb. 8, 1982, 82 01988
Int. Cl.³ A61K *31/505;* **C07D** *403/04*
U.S. Cl. 514—254 **16 Claims**

1. 4-piperazinyl 4-phenyl quinazoline compounds of the formula:

(II)



in which:

R_3 denotes a halogen or a nitro group,

R_4 represents H or an alkyl group having from 1 to 4 atoms of carbon,

R_5 represents a halogen and the salts of said derivatives with acids.

13. A method which comprises administering an anti-depressant effective amount of a compound according to claim **1** to a host in need thereof.

4,540,697

AMINOPROPANOL DERIVATIVES OF 2-HYDROXY-β-PHENYL-PROPIOPHENONES, PHARMACEUTICAL COMPOSITIONS AND USE

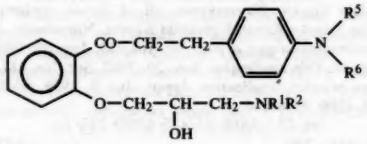
Albrecht Franke, Wachenheim; Josef Müller, Ludwigshafen; Helmut Lietz, Neustadt; Walter-Wielant Wiersdorff, Mutterstadt; Hans-Günther Hege, Neustadt; Claus D. Müller, Viernheim; Josef Gries, Wachenheim; Dieter Lenke, Ludwigshafen; Gerda von Philipsborn, Weinheim, and Manfred Raschack, Weisenheim am Sand, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 416,228, Sep. 9, 1982, abandoned. This application May 23, 1984, Ser. No. 613,389

Int. Cl.[3] **A61K** *31/135, 31/495;* **C07C** *97/10;* **C07D** *295/12*

U.S. Cl. 514—255 **10 Claims**

1. An aminopropanol derivative of the formula



wherein R^1 is n-propyl, isopropyl, cyclopropyl, 3-methoxyisopropyl or n-butyl, R^2 is hydrogen or together with R^1 and the nitrogen atom linking R^1 and R^2 form 4-methyl-piperazin-1-yl and R^5 and R^6 are methyl or ethyl or a physiologically acceptable acid addition thereof.

9. A therapeutic composition for treating cardiac arrhythmias and coronary insufficiency comprising a pharmaceutical excipient and an effective amount of an aminopropanol derivative as defined in claim **1**.

4,540,698

5-METHYLTHIOPYRIMIDINE DERIVATIVES, THEIR PREPARATION PROCESS AND FUNGICIDES CONTAINING SAME AS ACTIVE INGREDIENTS

Katsutoshi Ishikawa, Ashigara; Hitoshi Shimotori, Yokohama; Noboru Iida, Naga; Kazuo Akihiro, Yokohama, and Shuji Ozawa, Zushi, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jan. 14, 1983, Ser. No. 457,917

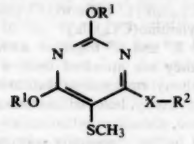
Claims priority, application Japan, Jan. 20, 1982, 57-6142

Int. Cl.[3] **A61K** *31/515;* **C07D** *239/62, 239/66*

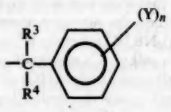
U.S. Cl. 514—270 **6 Claims**

6. A method for controlling plant diseases, which method comprises applying to plant pathogens or their habitats, as an effective component, 0.1–10 kg per hectare of a 5-methylthiopyrimidine derivative represented by the following formula (I):

(I)



wherein R^1 means an alkyl group having 1–6 carbon atoms or a phenyl, benzyl, alkenyl or alkoxyalkyl group, R^2 denotes an alkyl group having 1–6 carbon atoms, a phenyl, halogen-substituted phenyl, alkenyl, ω-phenyl-substituted alkenyl, alkynyl, alkoxyalkyl, alkoxyalkoxyalkyl, alkylthioalkyl, aminoalkyl, alkoxycarbonylalkyl, aminocarbonylalkyl, furfuryl, thienylmethyl or tetrahydrofuryl group or a



in which R^3 and R^4 are individually a hydrogen atom or methyl group, Y means a hydrogen or halogen atom or a methyl or methoxy group, and n stands for an integer of 1 or 2, and X denotes an oxygen or sulfur atom.

4,540,699

N-SUBSTITUTED PYRIDINONES HAVING HISTAMINE H_2-ANTAGONIST ACTIVITY

Thomas H. Brown, Tewin, and Derek A. Rawlings, Stevenage, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Nov. 29, 1983, Ser. No. 556,209

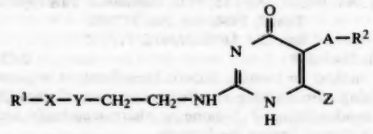
Claims priority, application United Kingdom, Dec. 3, 1982, 8234615

Int. Cl.[3] **A61K** *31/505;* **C07D** *239/02*

U.S. Cl. 514—272 **27 Claims**

1. A compound of the formula (I):

(I)



or a pharmaceutically acceptable salt thereof, wherein

R^1 is 2- or 4- imidazolyl optionally substituted by one C_{1-6}alkyl, halo, trifluoromethyl or hydroxymethyl;

1-thiazolyl;

2-guanidino-4-thiazolyl optionally substituted by one chloro, bromo or C_{1-6}alkyl;

2-(5-amino-1,3,4-thiadiazolyl);

3-isothiazolyl optionally substituted by one chloro or bromo;

3-(1,2,5)-thiadiazolyl optionally substituted by one chloro or bromo;

2-pyridyl optionally substituted by one C_{1-6}alkyl, C_{1-6}alkoxy, halo, amino or hydroxy moiety or substituted in the 4-position by a group $R^3R^4N(CH_2)_m$—wherein R^3 and R^4 are independently hydrogen, C_{1-6}alkyl, aryl(C_{1-6})alkyl, thienyl(C_{1-6})alkyl, furyl(C_{1-6})alkyl, hydroxy(C_{1-6})alkyl, halo(C_{1-6})alkyl or C_{3-8}cycloalkyl; or together with the

nitrogen atom to which they are attached form a 5–8 membered saturated ring; and m is 1 to 6;

2-furyl or 2-thienyl either optionally substituted in the 5-position by $R^3R^6N(CH_2)_m$—wherein R^5 and R^6 are independently hydrogen, C_{1-6}alkyl, C_{3-8}cycloalkyl, halo(C_{1-6})alkyl, C_{3-6}alkenyl, aryl (C_{1-6})alkyl, C_{3-6}alkynyl, hydroxy(C_{1-6})alkyl, C_{1-3}alkoxy(C_{1-6})alkyl, trifluoro(C_{1-6})alkyl, amino(C_{1-6})alkyl, C_{1-3}alkylamino(C_{1-6})alkyl or di-(C_{1-3})alkylamino(C_{1-6})alkyl; or R^5 and R^6 together with the nitrogen atom to which they are attached form a 5–8 membered saturated ring; phenyl optionally substituted by one C_{1-6}alkyl, C_{1-6}alkoxy, hydroxy, halo, trifluoromethyl, nitro, amino, C_{1-6}alkylamino, C_{1-6}alkanoylamino, di-(C_{1-6})alkylamino or cyano and further optionally substituted in any of the 3-, 4-, or 5-positions on the phenyl ring by $—(CH_2)_mNR^5R^6$, $—OCH_2CH_2NR^5R^6$ or $—OCH_2CH_2CH_2NR^5R^6$;

X is methylene, or if R^1 is optionally substituted pyridyl or phenyl, X may also be oxygen;

Y is sulfur or methylene, provided that at least one of X and Y is methylene;

Z is hydrogen or C_{1-6}alkyl;

A is C_{1-5}methylene or $—(CH_2)_pW(CH_2)_q$ where W is oxygen or sulphur and p and q are such that their sum is from 1 to 4;

R^2 is a pyridone moiety substituted on the nitrogen atom by a group R^7 wherein R^7 is $—(CH_2)_rNR^8R^9$ wherein R^8 and R^9 are independently hydrogen, C_{1-6}alkyl, C_{3-8}cycloalkyl, C_{3-6}alkenyl, aryl(C_{1-6})alkyl, C_{3-6}alkynyl, hydroxy(C_{1-6})alkyl, C_{1-3}alkoxy(C_{1-6})alkyl, trifluoro(C_{1-6})alkyl, amino(C_{1-6})alkyl, C_{1-3}alkylamino(C_{1-6})alkyl or di-(C_{1-3})alkylamino(C_{1-6})alkyl; or R^8 and R^9 together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino or hexahydroazepino ring, and r is 2 to 6; or R^7 is C_{1-6}alkyl, C_{3-7}cycloalkylC_{1-6}alkyl, hydroxyC_{2-6}alkyl, C_{1-6}alkoxyC_{2-6}alkyl, aryl(C_{1-6})alkoxyC_{2-6}alkyl, aryloxyC_{2-6}alkyl or aryl(C_{1-6})alkyl; and the pyridone moiety is optionally substituted on a carbon atom by one C_{1-4}alkyl, C_{1-4}alkoxy, hydroxy, halo, amino or phenoxy.

26. A method of blocking histamine H_2-receptors which comprises administering to an animal an effective amount to block said receptors of a compound of claim **1**.

4,540,700

TREATMENT OF DIABETIC COMPLICATIONS WITH CERTAIN SPIRO-IMIDAZOLIDINE-DIONES

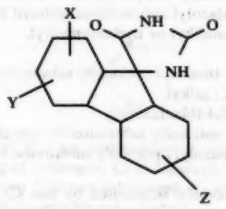
Billie M. York, Jr., Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 368,630, Apr. 15, 1982, Pat. No. 4,436,745, Ser. No. 368,631, Apr. 15, 1982, Pat. No. 4,438,272, and Ser. No. 368,632, Apr. 15, 1982, abandoned. This application Feb. 7, 1984, Ser. No. 577,692

Int. Cl.[3] **A61K** *31/415, 31/435*

U.S. Cl. 514—278 **2 Claims**

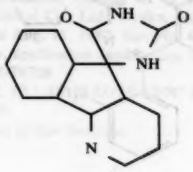
1. A method for treating diabetic complications in mammals comprising administering an effective amount of spiro-(fluoren-9,4′-imidazolidine)-2′,5′-dione or pharmaceutically acceptable salt thereof having the formula



where

x,y, and z are selected from the group consisting of NH_2, NO_2, and CO_2H.

2. A method for treating diabetic complications in mammals comprising administering an effective amount of spiro-(fluoren-9′,4′-imidazolidine)-2′,5′-dione or pharmaceutically acceptable salt thereof having the formula



4,540,701

2-NITROXYMETHYL AND 2,6-BIS-NITROXYMETHYL-PYRIDINE COMPOUNDS HAVING VASODILATING ACTIVITY

Ikuo Ueda, Osaka; Daizo Morino, Higashi-shinmachi, and Koichi Takimoto, Osaka, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 20, 1983, Ser. No. 515,653

Claims priority, application United Kingdom, Jul. 26, 1982, 8221592

Int. Cl.[3] **C07D** *213/53;* **A61K** *31/44*

U.S. Cl. 514—357 **5 Claims**

1. A pyridylalkyl nitrate compound selected from the group consisting of:

2,6-bis(nitroxymethyl)pyridine;

2,6-bis(nitroxymethyl)-4-chloropyridine; and

2-nitroxymethyl-6-chloropyridine.

5. A vasodilating pharmaceutical composition comprising an effective amount of a compound of claim **1** or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,540,702

2-SUBSTITUTED-4-THIAZOLIDONES

Takao Kawasaki, Sayama; Tadashi Tsuchiya, Matsudo, and Yoshiaki Osaka, Nagareyama, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

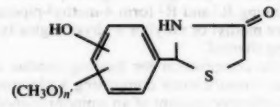
Continuation-in-part of Ser. No. 162,933, Jun. 25, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 412,964

Claims priority, application Japan, Jul. 9, 1979, 54-87056; May 23, 1980, 55-68506

Int. Cl.[3] **A61K** *31/425;* **C07D** *277/14*

U.S. Cl. 514—369 **3 Claims**

1. A 2-substituted-4-thiazolidone of the formula:

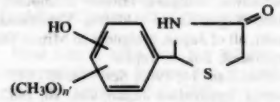


(III)

wherein n′ is an integer of 1 to 2.

2. A pharmaceutical composition in dosage unit form comprising

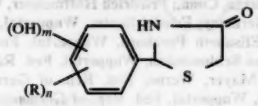
a dosage effective for the treatment of peptic ulcer of a 2-substituted-4-thiazolidone of the formula:



wherein n′ is an integer of 1 or 2, and

a pharmaceutically acceptable carrier.

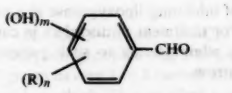
3. A process for producing 2-substituted-4-thiazolidone represented by the general formula (I):



(I)

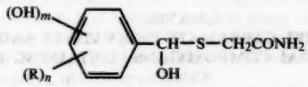
wherein R represents methoxy-, ethoxy-, carboxyl-, methylenedioxy- or dimethylamino-, n is an integer of 1 to 3, and m is 0 or 1 comprising the steps of:

(a) reacting a compound represented by the general formula (IV):



(IV)

wherein R, n and m represent the same as in the formula (I), with mercaptoacetic acidamide at a temperature of 10° to 50° C. to form an intermediate represented by the general formula (V):



(V)

wherein R, n and m represent the same as in formula (I);

(b) successively subjecting intermediate (V) to cyclization at a temperature of 50° to 150° C. thereby obtaining a compound according to formula (I).

4,540,703

TETRAZOLE DERIVATIVES, ANTI-ULCER COMPOSITION CONTAINING THE SAME AND METHOD FOR TREATING ULCERS

Minoru Uchida, Komatsujima; Takao Nishi, and Kazuyuki Nakagawa, both of Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Company, Limited, Japan

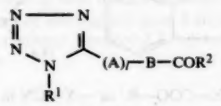
Continuation-in-part of Ser. No. 124,710, Feb. 26, 1980, abandoned. This application Dec. 23, 1981, Ser. No. 333,806

Claims priority, application Japan, Sep. 7, 1978, 53-110446

Int. Cl.[3] **A61K** *31/41;* **C07D** *257/04*

U.S. Cl. 514—381 **52 Claims**

1. A tetrazole derivative of the formula:



wherein R^1 is hydrogen, an alkyl having from 1 to 6 carbon atoms, a cycloalkyl having from 3 to 12 carbon atoms or phenyl; A is sulfur or an alkylene-thio having from 1 to 6 carbon atoms; l is 1, B is an alkylene having from 1 to 6 carbon atoms; R^2 is hydroxy, an alkoxy having from 1 to 6 carbon atoms, or a group:

wherein R^3 and R^4 are the same or different and are each hydrogen, an alkyl having from 1 to 6 carbon atoms, a cycloalkyl having from 3 to 12 carbon atoms, phenyl, a cycloalkylalkyl having from 1 to 6 carbon atoms in the alkyl moiety and from 3 to 8 carbon atoms in the cycloalkyl moiety, a phenylalkyl having from 1 to 6 carbon atoms in the alkyl moiety, a hydroxy alkyl having from 1 to 6 carbon atoms, said cycloalkyl, phenyl and phenyl alkyl may have on the cycloalkyl or phenyl ring one or two substituents selected from the group consisting of an alkoxy having from 1 to 6 carbon atoms, an alkyl having from 1 to 6 carbon atoms, a halogen, an N,N-dialkylamino having from 1 to 6 carbon atoms in each alkyl moiety, nitro, aminosulfonyl, hydroxy and an alkanoyloxy having from 1 to 6 carbon atoms; or a pharmaceutically-acceptable salt thereof.

31. A method for the treatment of peptic and duodenal ulcers by administering an anti-ulcer composition which comprises a compound of claim 1 or a pharmaceutically acceptable salt thereof in admixture with a pharmaceutically acceptable diluent or carrier.

4,540,704

TREATING COMPLICATIONS OF DIABETES MELLITUS WITH HYDANTOIN DERIVATIVES

Kouichiro Ueda, Saitama; Satoru Tanaka, Tokyo; Toshinobu Kunii; Kengo Kagei, both of Gifu; Tadashi Sato; Ono Hideki, both of Aichi; Issei Ohtsuka; Mayumi Kawase, both of Gifu; Toshiharu Ohgoh, Aichi, and Tsuneo Wakabayashi, Gifu, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

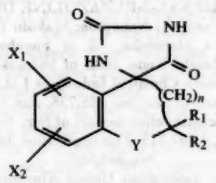
Continuation of Ser. No. 284,566, Jul. 17, 1981, abandoned. This application Jun. 7, 1983, Ser. No. 500,801

Claims priority, application Japan, Jul. 21, 1980, 55-98695

Int. Cl.[3] **A61K** *31/415;* **C07D** *491/107, 495/10*

U.S. Cl. 514—389 **11 Claims**

1. A hydantoin derivative represented by the formula:



wherein X_1 and X_2, which may be the same or different, independently represent a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group, Y represents an oxygen atom or sulfur atom, R_1 represents hydrogen and R_2 represents a lower alkyl group, and n represents 0 or 1, or a pharmaceutically acceptable salt thereof.

10. A method for treating chronic complications of diabetes mellitus which comprises administering to a patient suffering from such complications of diabetes mellitus an effective amount for treating such complication, of a hydantoin derivative according to claim 1.

4,540,705

ANTIDEPRESSANT IMIDAZOLINES AND RELATED COMPOUNDS

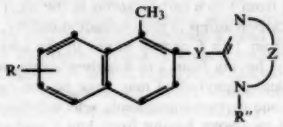
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Mar. 14, 1983, Ser. No. 475,193

Int. Cl.[3] **A61K** *31/415;* **C07D** *233/06, 233/58*

U.S. Cl. 514—401 **21 Claims**

18. A method for treating depressed states in warm blooded animals, which comprises administering a composition which comprises an antidepressantly effective amount of a compound of the formula



wherein:

R′ is hydrogen, lower-alkyl, lower-alkoxy or halo;

R″ is hydrogen or lower-alkyl;

Y is an alkylene bridge of 1–2 carbons; and

Z is —C=C— or an alkylene bridge of 2 carbon atoms optionally substituted by one or two alkyl groups of 1–2 carbon atoms;

or a pharmaceutically acceptable acid-addition salt thereof; together with one or more pharmaceutically acceptable excipients.

4,540,706

INSECTICIDAL 1-N-PHENYLCARBAMOYL-3-(4-DIFLUOROMETHOXY-PHENYL)-4-PHENYL-2-PYRAZOLINE DERIVATIVES

Kiyomi Ozawa; Yasuyuki Nakajima; Makoto Tsugeno; Shigeru Ishii; Masataka Hatanaka, all of Funabashi; Masayoshi Hirose, and Masaki Kudo, both of Shirasoka, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 455,735, Jan. 5, 1983, Pat. No. 4,464,386, and a continuation-in-part of Ser. No. 292,710, Aug. 13, 1981, Pat. No. 4,407,813. This application Jan. 27, 1983, Ser. No. 461,666

Claims priority, application United Kingdom, Feb. 5, 1982, 8203354

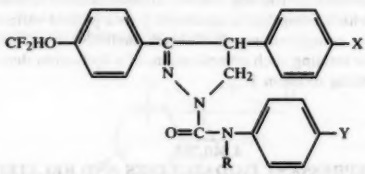
The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.

Int. Cl.³ A01N *43/56*; C07D *231/06*

U.S. Cl. 514—403 **13 Claims**

1. A pyrazoline derivative having the formula

[I]



wherein X represents a hydrogen atom or a halogen atom; Y represents a halogen atom, a trifluoromethyl group or —A—R′; R represents a C_1-C_{10} alkyl group, a lower alkenyl group or a lower alkynyl group; and A represents an oxygen atom, a sulfur atom, a sulfinyl group or a sulfonyl group and R′ represents a halogen-substituted lower alkyl group.

13. An insecticidal composition which comprises a carrier and an insecticidally effective amount of a pyrazoline derivative defined in claim **1** as an active ingredient.

4,540,707

NAFAZATROM AS A LIPOXYGENASE INHIBITOR

Mithat Mardin, Wuppertal, Fed. Rep. of Germany; Wolf-Dieter Busse, West Haven, Conn.; Friedrich Hoffmeister, Wuppertal, Fed. Rep. of Germany; Friedel Seuter, Wuppertal, Fed. Rep. of Germany; Elisabeth Perzborn, Wuppertal, Fed. Rep. of Germany; Klaus Schlossmann, Wuppertal, Fed. Rep. of Germany; Dieter Mayer, Werne, Fed. Rep. of Germany, and Volker Fiedler, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 486,175

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1983, 3302811; Mar. 12, 1983, 3308880

Int. Cl.³ A61K *31/415*

U.S. Cl. 514—404 **1 Claim**

1. A method of inhibiting lipoxygenase in a patient, for the prophylaxis and/or treatment of disorders in cardiac rhythm, which comprises administering to such patient an effective amount of nafazatrom.

4,540,708

SULFENYL CARBAMATE DERIVATIVES AND INSECTICIDAL COMPOSITIONS CONTAINING THE SAME

Hisashi Takao, Tokushima, Japan, assignor to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

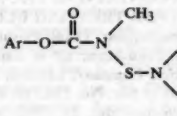
Filed Nov. 2, 1983, Ser. No. 548,127

Claims priority, application Japan, Nov. 11, 1982, 57-198412

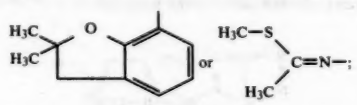
Int. Cl.³ A01N *47/24*; C07D *307/86*

U.S. Cl. 514—469 **4 Claims**

1. A sulfenyl carbamate derivative represented by the formula

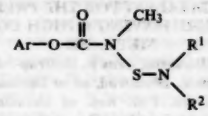


wherein Ar represents

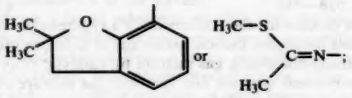


R^1 represents —X—COO—R^3 or —Y—CN in which each of X and Y is an alkylene group having 1 to 6 carbon atoms and R^3 is an alkyl group having 1 to 8 carbon atoms; R^2 represents —CH_2—$_n$O—R^4 in which R^4 is an alkyl group having 1 to 5 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, a phenyl group which is unsubstituted or substituted with 1 to 3 substituents selected from the group consisting of halogen, an alkyl group having 1 to 4 carbon atoms and an alkoxy group having 1 to 4 carbon atoms, or a benzyl group which is unsubstituted or substituted with 1 to 3 substituents selected from the group consisting of halogen, an alkyl group of 1 to 4 carbon atoms and an alkoxy group of 1 to 4 carbon atoms; and n is an integer of 2 to 5.

2. An insecticidal composition comprising an insecticidally effective amount of a sulfenyl carbamate derivative represented by the formula



wherein Ar represents



R^1 represents —X—COO—R^3 or —Y—CN in which each of X and Y is an alkylene group having 1 to 6 carbon atoms and R^3 is an alkyl group having 1 to 8 carbon atoms; R^2 represents —CH_2—$_n$O—R^4 in which R^4 is an alkyl group having 1 to 5 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, a phenyl group which is unsubstituted or substituted with 1 to 3 substituents selected from the group consisting of halogen, an alkyl group having 1 to 4 carbon atoms and an alkoxy group having 1 to 4 carbon atoms, or a benzyl group which is unsubstituted or substituted with 1 to 3 substituents selected from the group consisting of halogen, an alkyl group of 1 to 4 carbon atoms and an alkoxy group of 1 to 4 carbon atoms; and n is an integer of 2 to 5, in combination with an insecticidally acceptable solvent, diluent or carrier.

4,540,709

METHOD FOR TREATMENT OF DISEASES MEDIATED BY PAF USING 5-ALLYL-2-(3,4-DIMETHOXYPHENYL)-3A,α-METHOXY-3-METHYL-2,3,3A,6-TETRAHYDRO-6-OXOBENZOFURAN

Michael N. Chang, Westfield, and San-Bao Hwang, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 13, 1983, Ser. No. 541,806
Int. Cl.³ A61K *31/34*
U.S. Cl. 514—470 **1 Claim**

1. A method of treatment of diseases or conditions mediated by platelet-activating factor comprising the administration to a mammalian species in need of such treatment a therapeutically effective amount of substantially pure 5-allyl-2-(3,4-dimethoxyphenyl)-3a,α-methoxy-3-methyl-2,3,3a,6-tetrahydro-6-oxobenzofuran.

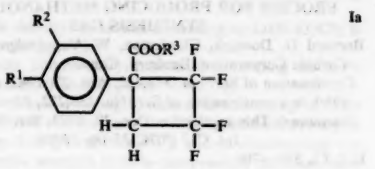
4,540,710

INSECTICIDAL ESTER ENANTIOMERS

George Holan, Brighton, and Reimund A. Walser, Box Hill, both of Australia, assignors to The Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

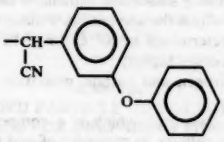
Division of Ser. No. 269,735, Jun. 2, 1981, Pat. No. 4,391,820. This application Mar. 8, 1983, Ser. No. 473,338
Claims priority, application Australia, Jun. 13, 1980, PE4038
Int. Cl.³ C07C *121/50, 69/76*; A01N *37/34, 37/10*
U.S. Cl. 514—521 **10 Claims**

1. Compounds of the formula Ia



Ia

characterised in that R^1 is ethoxy or chloro, and R^2 is hydrogen; or R^1 and R^2 together form a methylenedioxy group; R^3 is



and the compounds are in the form of the (−)(−) diastereoisomers.

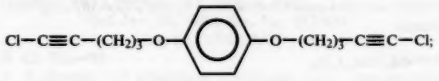
4,540,711

METHOD FOR COMBATTING INFESTATIONS OF INSECTS AND ACARI, AND COMPOSITIONS FOR USE IN SAID METHOD

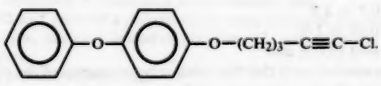
Franco Bettarini, Novara; Pietro Massardo, Milan; Paolo Piccardi, Milan, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 50,335, Jun. 20, 1979, abandoned, and a continuation-in-part of Ser. No. 198,488, Oct. 20, 1980, Pat. No. 4,356,329, and a continuation-in-part of Ser. No. 355,640, Mar. 8, 1982, abandoned, and a continuation-in-part of Ser. No. 379,177, May 17, 1982, Pat. No. 4,460,606. This application Apr. 5, 1983, Ser. No. 482,261
Claims priority, application Italy, Jun. 21, 1978, 24794 A/78; Mar. 5, 1979, 20734 A/78; Jan. 22, 1982, 19237 A/82
Int. Cl.³ A01N *31/14*
U.S. Cl. 514—720 **13 Claims**

1. A method for combatting infestations of insects or acari, which consists in treating the insect, its habitat, or its food with an insecticidally or acaricidally effective amount of at least 0.02 ppm of a diether selected from the group consisting of 1,4-di-(5-chloro-4-pentinyloxy)-benzene having the formula:



and 1-(5-chloro-4-pentinyloxy)-4-phenoxybenzene having the formula:



4,540,712

PROCESS FOR PRODUCING METHANOL FROM SYNTHESIS GAS

Bernard D. Dombek, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 372,412, Apr. 27, 1982, abandoned, which is a continuation of Ser. No. 135,775, Mar. 31, 1980, abandoned. This application Dec. 20, 1983, Ser. No. 563,270

Int. Cl.[3] C07C *27/06, 31/04*

U.S. Cl. 518—700 15 Claims

1. The process for making the products methanol or carboxylate derivatives thereof directly from synthesis gas mixtures consisting of hydrogen and carbon monoxide, which comprises;

establishing and maintaining a solvent-containing liquid phase comprising solubilized ruthenium carbonyl catalyst complex in which the solvent has a dielectric constant of at least 2, determined at 20° C. or at its melting point, whichever occurs higher;

supplying hydrogen and carbon monoxide to said liquid phase;

providing a Lewis acid which is a compound of boron, aluminum or gallium, as promoter of said reaction in said liquid phase; and

maintaining said liquid phase for a sufficient period of time at a temperature and pressure which causes said hydrogen and carbon monoxide to react to produce such products in high concentrations with substantially no by-products or other alcohols being prepared, wherein said temperature is between about 50° C. and 400° C. and said pressure is between about 500 psia (35.15 kg/cm^2) and 15,000 psia (1,054.6 kg/cm^2).

4,540,713

PREPARATION OF ALCOHOLS FROM SYNTHESIS GAS

Harley F. Hardman, Lyndhurst, and Ronald I. Beach, Chagrin Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 503,076, Jun. 13, 1983, abandoned, which is a continuation of Ser. No. 393,829, Jun. 30, 1982, abandoned, which is a continuation of Ser. No. 54,216, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 905,703, May 15, 1978, abandoned. This application Aug. 7, 1984, Ser. No. 639,512

Int. Cl.[3] L07C *27/06*

U.S. Cl. 518—713 8 Claims

1. A process for producing a mixture of methanol and higher alcohols comprising contacting a gaseous reactant containing carbon monoxide and hydrogen at a temperature in the range of 250° to 350° C. and a pressure of no more than 1500 psi with an oxide complex catalyst described by the following empirical formula:

$$Cu_aThM_bA_cO_x$$

wherein

M is one or more of Ca, Rh, Pt, Al, La, Re, Ru and Pd;

A is an alkali metal; and

wherein

a is 0.5 to 2.5;

b is 0.01 to 1.0;

c is 0.05 to 0.9; and

x is a number such that the valence requirements of the other elements for oxygen is satisfied.

4,540,714

PROCESS AND CATALYST FOR THE PREPARATION OF A GAS MIXTURE HAVING A HIGH CONTENT OF METHANE

Karsten Pedersen, Birkerod; Jens R. Rostrup-Nielsen, Virum; Ib Greve H. Jorgensen, Bloustrod, all of Denmark, and Kjeld J. Andersen, Umkirsch, Fed. Rep. of Germany, assignors to Haldor Torsoe A/S, Lyngbry, Denmark

Filed Nov. 1, 1982, Ser. No. 438,527

Claims priority, application Denmark, Dec. 18, 1979, 5396/79

Int. Cl.[3] C07C *1/04*

U.S. Cl. 518—714 4 Claims

1. In a process for the conversion of a synthesis gas mixture containing hydrogen, carbon oxides and at least one other gas to a methane-containing gas mixture by catalytic conversion, the improvement wherein said synthesis gas mixture contains at least one gaseous sulfur compound in an amount of at least 10 ppm, calculated as H_2S, and said conversion is conducted at a temperature of 250°–850° C. and a pressure of 1–150 bar in the presence of a catalyst consisting of at least one component selected from the group consisting of vanadium and molybdenum, salts, oxides and sulfides thereof, said catalyst being deposited on a support consisting of porous titanium dioxide, whereby the product gas mixture contains at least 50%, by weight, of methane based on the amount of carbon in said synthesis gas mixture converted to hydrocarbons.

4,540,715

SURFACTANT AND ALKALI METAL CITRATE COMPOSITION FOR RECHARGING A WATER SOFTENER

Kurt J. Waatti, Woodstock, Ill., and Daniel R. Border, Wadsworth, Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Sep. 6, 1983, Ser. No. 529,311

Int. Cl.[3] C08D *5/20;* C11D *1/12, 1/755*

U.S. Cl. 521—26 5 Claims

5. A method for regenerating the spent hardness cation exchange resin bed of a water softener, comprising the step of contacting said resin bed with an aqueous brine solution containing from about 25 to about 1200 ppm of sodium citrate and from about 0.5 to about 60 ppm of an alkylated diphenyl oxide disulfonate surfactant.

4,540,716

METHOD FOR MAKING FINELY DIVIDED PERFLUOROCARBON COPOLYMER

Michael J. Covitch, Cleveland Hts., and Gary G. Sweetapple, Painesville, both of Ohio, assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Jan. 13, 1983, Ser. No. 457,580

Int. Cl.[3] C08D *5/20;* C08F *6/00*

U.S. Cl. 521—28 6 Claims

1. A method for making particles in a size range of from about 0.5 microns to about 100 microns of a perfluorocarbon copolymer, the copolymeric perfluorocarbon being a copolymer of two monomers, one monomer being selected from a group consisting of vinyl fluoride, hexafluoropropylene, vinylidene fluoride, trifluoroethylene, chlorotrifluoroethylene, perfluoro(alkylvinyl ether), tetrafluoroethylene and mixtures thereof, the second monomer being selected from a group of monomers containing at least one of a pendant SO_2F based functional group and a pendant COF based functional group, the second monomer being represented by the generic formula $CF_2{=}CFR_1SO_2F$ or $CF_2{=}CFR_1COF$, with R_1 being a bifunctional perfluorinated radical comprising generally 1 to 8 carbon atoms, the carbon atom adjacent the SO_2F or COF based group having at least one attached fluorine, the copolymeric perfluorocarbon having an equivalent weight of at least about 900, but not greater than about 1500, the method comprising:

dissolving the copolymeric perfluorocarbon in a quantity of a solvent selected from a group consisting of halocarbon

oil, perfluorooctonic acid, perfluorodecanoic acid, perfluorotributylamine, perfluorotrialkylamine, perfluoro-1-methyldecalin, decafluorobiphenyl, pentafluorophenol, pentafluorobenzoic acid, N-butylacetamide, tetrahydrothiophene-1,1-dioxide, N,N-dimethyl acetamide, N,N-diethyl acetamide, N,N-dimethyl propionamide, N,N-dibutylformamide, N,N-dipropylacetamide, N,N-dimethyl formamide, 1-methyl-2-pyrrolidinone and mixtures thereof, at a temperature at least in excess of room temperture but not greater than about 300° C. to achieve a solution of at least 2% by weight of the copolymeric perfluorocarbon in the solvent;

identifying a liquid substance miscible with the solvent in which the perfluorocarbon copolymer is essentially insoluble, and selected from a group consisting of aromatic hydrocarbons, halogenated hydrocarbons, ethers, aqueous and non-aqueous solutions of acids, bases and salts and mixtures thereof;

reducing the temperature of the solution to a point at least below the boiling point of the liquid substance; and

combining the miscible substance with the solution to precipitate the copolymeric perfluorocarbon from the solution as a quite finely divided particulate.

4,540,717
RESILIENT FOAM BASED ON A MELAMINE-FORMALDEHYDE CONDENSATE

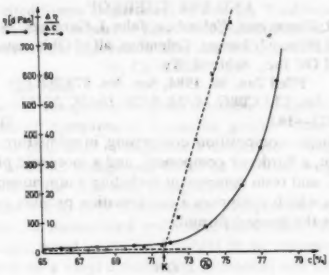
Harald Mahnke, Ludwigshafen; Frank P. Woerner, Wachenheim; Heinz Weber, Gruenstadt, and Guenter Kreibiehl, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 530,695, Sep. 9, 1983, and a continuation-in-part of Ser. No. 400,050, Jul. 20, 1982, and Ser. No. 330,373, Dec. 14, 1981, which is a division of Ser. No. 242,561, Mar. 11, 1981, Pat. No. 4,334,971, said Ser. No. 530,695, is a continuation-in-part of Ser. No. 516,855, Jul. 25, 1983, which is a continuation of Ser. No. 366,566, Apr. 8, 1982, which is a continuation of Ser. No. 126,393, Jul. 20, 1982, abandoned. This application Dec. 17, 1984, Ser. No. 682,551

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1979, 2915457; Apr. 17, 1979, 2915467; Mar. 27, 1980, 3011769

Int. Cl.³ C08J *9/38*

U.S. Cl. 521—52 **20 Claims**



1. A resilient reticulated foam based on a melamine/formaldehyde condensate which contains not less than 50% by weight of melamine and formaldehyde as condensed units, and from 0 to 50% by weight of other compounds selected from the group consisting of alkyl-substituted melamine, urea, urethanes, carboxylic acid amides, dicyandiamide, guanidine, sulfurylamide, sulfonic acid amides, aliphatic amines, phenol and phenol derivates and containing amino, amide, hydroxyl or carboxyl groups and capable of forming thermosetting resins, and aldehydes selected from the group consisting of acetaldehyde, trimethylolacetaldehyde, acrolein, benzaldehyde, furfuraldehyde, glyoxal, phthalaldehyde and terephthalaldehyde and which react therewith to form such resins, as co-condensed units, which resilient foam exhibits the following properties:

(a) the bulk density, measured according to DIN 53,420, is from 4 to 80 [$g.l^{-1}$];

(b) the heat conductivity measured according to DIN 52,612, is less than 0.06 [$W.m^{-1}.°K^{-1}$];

(c) the compressive strength, measured according to DIN 53,577 at 60% compression, divided by the bulk density, is less than 0.30 [$N.cm^{-2}/g.l^{-1}$], and in determining the compressive strength at 60% compression the foam must recover to not less than 90% of its original height;

(d) the modulus of elasticity, measured by methods similar to DIN 53,423, divided by the bulk density is less than 0.25 [$N.mm^{-2}/g.l^{-1}$];

(e) the deflection on break, measured according to DIN 53,423, is greater than 9 [mm]; and

(f) the foams are of not more than normal flammability when assessed according to DIN 4,120.

4,540,718
PRE-EXPANDED PARTICLE OF POLYOLEFINE AND PROCESS FOR PREPARING THE SAME

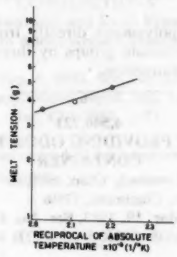
Kenichi Senda, Hirakata; Masao Ando, Toyonaka; Kyoichi Nakamura, Settsu, and Tatehiko Nishida, Ibaraki, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 29, 1984, Ser. No. 584,859

Claims priority, application Japan, Apr. 5, 1983, 58-60591; Jan. 18, 1984, 59-7634

Int. Cl.³ C08J *9/18*

U.S. Cl. 521—58 **3 Claims**



1. A pre-expanded particle of non-crosslinked linear low density ethylene polymer which is a copolymer of ethylene and an α-olefin of C_4 to C_{20} having a melt index of 0.1 to 50 g/10 min., a density of 0.910 to 0.940 g/cm^3 and a melting point of 110° to 130° C.

4,540,719
PROCESS FOR MAKING FOAMED, SULFUR-CURED POLYMER BLEND COMPOSITIONS

Gary L. Loomis, Drexel Hill, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 18, 1985, Ser. No. 692,634

Int. Cl.³ C08J *9/06*

U.S. Cl. 521—89 **9 Claims**

1. A process for producing a foamed, cured composition comprising a polymer blend of

(1) 5 to 95 parts of E/X/Y copolymer, wherein
E is ethylene;
X is a vinyl ester; and
Y is carbon monoxide or sulfur dioxide; and

(2) 95 to 5 parts of a polymer of a vinyl halide or vinylidene halide, the total amont of polymers (1) plus (2) being 100 parts;

said process comprising:

(A) uniformly dispersing in said polymer blend an effective

amount of a blowing agent and at least one curing agent selected from

(a) about 0.2 to 5 parts of sulfur and (b) about 0.2 to 15 parts of an agent capable of releasing elemental sulfur under the cure conditions; and

(B) heating said blend containing the blowing agent and the curing agent at a temperature of about 100°–180° C., at which both foaming and curing take place, for a sufficient time to obtain substantially complete foaming and curing.

4,540,720

POLYAMINES, A PROCESS FOR THE PRODUCTION OF POLYAMINES AND THEIR USE IN THE PRODUCTION OF POLYURETHANES

Werner Rasshofer, Cologne; Gerhard Grögler, Leverkusen; Klaus König, Leverkusen, and Dieter Dieterich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 26, 1982, Ser. No. 401,472

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131252

The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.

Int. Cl.[3] **C07C** *127/15, 127/24*

U.S. Cl. 521—159 **14 Claims**

1. A process for the production of aromatic and/or aliphatic, primary polyamines by the hydrolysis of compounds containing isocyanate groups, comprising

(I) converting aromatic and/or aliphatic compounds containing from 0.5 to 40% by weight of isocyanate groups into compounds containing carbamate groups by mixing said aromatic and/or aliphatic compounds with a strong aqueous base and at least a stoichiometric quantity of water and

(II) recovering polyamines directly from the compounds containing carbamate groups by thermal decomposition or by solvent extraction.

4,540,721

METHOD OF PROVIDING ODOR TO PRODUCT CONTAINER

Kerry P. Staller, Loveland, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 10, 1983, Ser. No. 474,102

Int. Cl.[3] **B65D** *5/08;* **C08K** *5/00;* **C11B** *9/00;* **A61K** *7/46*

U.S. Cl. 523—102 **40 Claims**

1. A method for using scented oils to provide odor to a container of a product having a constituent incompatible with said scented oils, said method comprising:

(a) preparing an aqueous emulsion consisting essentially of:

(1) from about 4% to about 70% of a polymer, said polymer being selected from a group consisting of water-emulsifiable polymers and water-soluble polymers,

(2) from about 5% to about 80% of scented oils, and

(3) from about 6% to about 80% of water;

(b) drying said aqueous emulsion, whereby said scented oils are entrapped within a matrix of said polymer; and

(c) including a coating of said polymer matrix on a surface of said container of said product, whereby said scented oils are protected by said polymer matrix from degradation by said constituent and diffuse from said polymer matrix over a period of time.

4,540,722

DENTIN AND ENAMEL ADHESIVE

James E. Bunker, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 15, 1982, Ser. No. 339,290

Int. Cl.[3] **C08F** *130/02*

U.S. Cl. 523—109 **24 Claims**

1. Dental bonding compositions comprising a mixture of:

(a) free-radically polymerizable phosphorus compound which, upon polymerization thereof, adheres to dentin and enamel,

(b) an effective amount of an ion of a metal selected from the group consisting of Fe, Cu, Mn, Co, Sn, Cr, Ni, and Zn, dissolved in a polar organic solvent, said ion enhancing adhesion of said mixture to dentin upon polymerization of said mixture,

(c) sulfur compound having sulfur in the $^{+2}$ or $^{+4}$ oxidation state, said sulfur compound acting as an activator for polymerization of said mixture,

(d) tertiary amine,

(e) polymerization catalyst, and

(f) diluent.

4,540,723

DENTAL RESTORATIVE COMPOSITION CONTAINING MONOFUNCTIONAL MONOMER AND DIOLEFINICALLY UNSATURATED MONOMER

Lincoln Ying, Bridgewater, N.J., assignor to J&J Dental Products Inc., East Windsor, N.J.

Filed May 16, 1984, Ser. No. 610,909

Int. Cl.[3] **C08L** *33/08*

U.S. Cl. 523—115 **6 Claims**

1. A dental restorative composition comprising a polymerizable composition containing at least two olefinically unsaturated groups, a filler, and a minor proportion of a monofunctional monomer consisting essentially of benzyl acrylate or methacrylate.

4,540,724

PHENOLIC RESIN-POLYISOCYANATE BINDER SYSTEMS CONTAINING A PHOSPHORUS HALIDE AND USE THEREOF

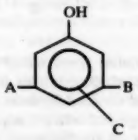
William R. Dunnavant, Columbus; John J. Gardikes, Worthington, and Heimo J. Langer, Columbus, all of Ohio, assignors to Ashland Oil Inc., Ashland, Ky.

Filed Jan. 30, 1984, Ser. No. 575,208

Int. Cl.[3] **C08G** *18/54, 8/28, 18/28, 18/32*

U.S. Cl. 523—143 **21 Claims**

1. A binder composition comprising in admixture a resin component, a hardener component, and a inorganic phosphorus halide, said resin component including a non-aqueous phenolic resin which comprises a condensation product of a phenol having the general formula:



wherein A, B and C are hydrogen, hydrocarbon radicals, or halogen, wherein at least about 5 mole percent of said phenol is a nonyl phenol with an aldehyde having the general formula R'CHO wherein R' is a hydrogen or a hydrocarbon radical of 1 to 8 carbon atoms; said hardener component comprising liquid polyisocyanate containing at least two isocyanate groups.

4,540,725

PIGMENT GRINDING VEHICLE

Robert D. Jerabek, Glenshaw; Jeffrey G. Koren, Butler, and Mark W. Johnson, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

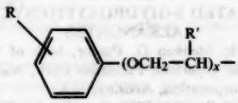
Continuation of Ser. No. 430,185, Sep. 30, 1982, abandoned. This application Aug. 15, 1984, Ser. No. 641,350
Int. Cl.[3] C08L 63/00
U.S. Cl. 523—400 10 Claims

1. A quaternary ammonium group-containing material which is obtained from reacting:

(i) a polyepoxide having a 1,2-epoxy equivalency greater than one,

(ii) an amine containing at least one organic group which contains an acyclic moiety of about 8 to 30 carbon atoms, and

(iii) an amine containing an alkylarylpolyether moiety of the formula:



wherein R is an alkyl group containing from 1 to 30 carbon atoms, R' is hydrogen or lower aklyl containing from 1 to 5 carbon atoms and x is equal to 3 to 20,

under conditions sufficient to form the quaternary ammonium group; the equivalent ratio of (i):(ii):(iii) is about 1:0.4 to 1:0.1 to 0.6 and the equivalent ratio of (i):(ii)+(iii) is equal to or greater than 1.

4,540,726

ELECTROPOSITIVE BIVALENT METALLIC ION UNSATURATED POLYESTER COMPLEXED POLYMER CONCRETE

Toshifumi Sugama, Mastic Beach; Lawrence E. Kukacka, Port Jefferson, and William H. Horn, Brookhaven, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 318,080, Nov. 4, 1981, abandoned. This application May 13, 1983, Ser. No. 494,484
Int. Cl.[3] C08K 3/12
U.S. Cl. 523—505 6 Claims

1. A water compatible polymer concrete composition which will achieve compressive strengths greater than 2000 psi within one hour after mixing over a temperature range of from −5° C. to 40° C. comprising based on the total weight of the composition, the following components:

(a) from 8% to 20% of a polyester composition which contains an unsaturated polyester, from 30% to 60% by weight, based on the total weight of the polyester composition, of a vinyl crosslinking monomer, and from 0.02% to 5.0% by weight, based on the total weight of the polyester composition, of a promoter selected from the group consisting of cobalt napthenate, dimethyl aniline, mixtures thereof,

(b) a minor proportion, up to 5% by weight, of a free-radical initiator for curing the polyester and the crosslinking monomer,

(c) from 60% to 80% of an aggregate system composed of silica sands or silica sands mixed with limestone and/or crushed stone,

(d) from 0.75% to 10% water, and

(e) the balance Portland cement which will release calcium ions into an aqueous system,

said composition polymerizing to produce a polymer concrete.

4,540,727

POLYAMIDE COMPOSITIONS

Christine E. Vogdes, Albany, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 29, 1982, Ser. No. 437,657
Int. Cl.[3] C08K 3/34, 3/22
U.S. Cl. 524—83 39 Claims

1. A composition which comprises

(a) an organic polymer component which comprises a polyamide;

(b) distributed in said polymer component, at least 0.5% by weight, based on the weight of the polyamide component, of an antioxidant; and

(c) dispersed in said polymer component, an oxide which is present in an amount of from 0.5 to 5.0% by weight of the polyamide component and which can function as an acid scavenger in the composition, which is free from any coupling agent which substantially reduces its efficacy as an acid scavenger, and which is selected from

(i) metal oxides which consist of oxygen and at least one metal, said at least one metal comprising a metal of Group II or III of the Periodic Table; and

(ii) oxides which consist of oxygen, silicon, and at least one metal, said at least one metal comprising a metal of Group II or III of the Periodic Table;

the total amount of the antioxidant (b) and the oxide (c) being at least 1% by weight, based on the weight of the polyamide.

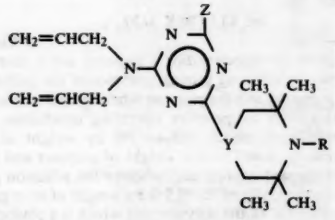
4,540,728

DIALLYL-1,3,5-TRIAZINO-4-(2,2,6,6-TETRAMETHYL PIPERIDYL) AMINES AS MONOMERS AND POLYMERS AND STABILIZED SYNTHETIC RESIN COMPOSITIONS

Yutaka Nakahara, Iwatsuki, and Ryoji Kimura, Urawa, both of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Sep. 9, 1983, Ser. No. 531,147
Claims priority, application Japan, Sep. 13, 1982, 57-159198
Int. Cl.[3] C08K 5/34
U.S. Cl. 524—100 33 Claims

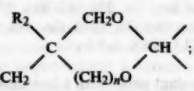
1. Diallyl-1,3,5-triazino-4-(2,2,6,6-tetramethyl piperidyl)amines having the formula:



wherein:

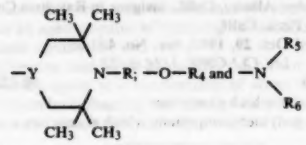
R is selected from the group consisting of hydrogen; oxyl; alkyl and hydroxyalkyl having from one to about eighteen carbon atoms; alkylaryl having from seven to about eighteen carbon atoms; epoxy alkyl having from three to about eighteen carbon atoms; and acyl having from two to about eighteen carbon atoms;

Y is



where R_2 and R_3 are hydrogen or alkyl having from one to about eight carbon atoms and n is 0 or 1;

Z is selected from the group consisting of



in which R_4, R_5 and R_6 are selected from the group consisting of hydrogen; alkyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about twelve carbon atoms; and aryl having from six to about thirty carbon atoms.

4,540,729

POLYESTER MOULDING COMPOSITIONS

Richard S. Williams, Bromsgrove, England, assignor to BIP Chemicals Limited, Manchester, England

Filed Sep. 13, 1984, Ser. No. 650,082

Claims priority, application United Kingdom, Sep. 16, 1983, 8324879

Int. Cl.³ C08L 67/02; C08K 3/40, 5/09

U.S. Cl. 524—114 **11 Claims**

1. A polyester moulding composition which comprises polyethylene terephthalate, or a polyesther containing at least 80% of polyethylene terephthalate repeating units, polycaprolactone having a number average molecular weight over 10,000, a nucleant for crystallisation of the polyethylene terephthalate and an epoxidised unsaturated triglyceride containing at least one epoxide group.

4,540,730

PROCESS FOR INCORPORATING PIGMENTS INTO THERMOPLASTICS, AND ADHESION PROMOTERS FOR USE IN THIS PROCESS

Manfred Kieser, Darmstadt, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,302

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 3221044

Int. Cl.³ C08K 5/20

U.S. Cl. 524—230 **9 Claims**

1. In a process for incorporating a pigment into a thermoplastic polymer, comprising mixing granules of the polymer, an adhesion promoter and the pigment whereby said mixture is treatable under high temperature operating conditions, the improvement wherein about 0.05 to 2% by weight of the adhesion promoter, based on the weight of polymer and pigment, is added in said mixture and wherein the adhesion promoter consists essentially of 95–99.9% by weight of an organic solvent compatible with the polymer and which is a plasticizer therefor and 0.1–5% by weight of a surfactant which is structurally stable under said high temperature operating conditions.

4,540,731

LOW TEMPERATURE CURE SEALANT

John P. Gilvary, and John V. Lawton, both of South Bend, Ind., assignors to Niles Chemical Paint Co., Niles, Mich.

Continuation of Ser. No. 351,412, Feb. 23, 1982, abandoned, which is a continuation of Ser. No. 234,645, Feb. 17, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 544,845

Int. Cl.³ C08K 5/54

U.S. Cl. 524—269 **9 Claims**

1. A composition for a sealant paste with a low cure temperature comprising, in parts by weight:

from 10 to 100 parts of vinyl chloride/vinyl acetate copolymer dispersion resin having an inherent viscosity in excess of 0.9 when measured at 30° C. using 2 grams of resin and 100 ml. of cyclohexane;

from 10 to 100 parts of a blending resin, being one of vinyl chloride homopolymer and vinyl chloride/vinyl acetate;

from 10 to 100 parts of a solution of vinyl chloride/vinyl acetate solution grade resin, said solution grade resin being essentially free from products of ketone-aldehyde condensation, and a plasticizer wherein said vinyl acetate composes 9–11 percent of said resin and the ratio of said resin is from 1:10 to 1:100 parts of said plasticizer;

from 10 to 350 parts of a filler of one of an alkaline earth metal carbonate, a sulfate, and a platy talc filler;

from 0.25 to 5 parts of a silane adhesion promoter having an organo-functional trihydrolyzable silane wherein said organo-functional group is bonded to silicon by a carbon-to-silicon bond and the organo-functional group is an NH_2 group.

4,540,732

ALKYLATED S-(HYDROXYPHENYLTHIO) ALKANOATES

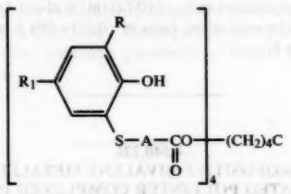
John D. Spivack; Stephen D. Pastor, both of Spring Valley, N.Y., and Paul Odorisio, Palisades Park, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,520

Int. Cl.³ C08K 5/36; C07C 149/40

U.S. Cl. 524—289 **9 Claims**

1. The compound of the formula



wherein

R and R_1 are alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 18 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 18 carbon atoms;

A is $—CH(R_2)—$, $—CH(R_2)CH(R_3)—$ or $—CH_2—CH(R_2)—CH_2—$; and

R_2 and R_3 are independently hydrogen or methyl.

6. A composition of matter comprising an organic material subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of claim 1.

4,540,733

ANTICORROSIVE METAL SURFACE PRETREATING COMPOSITION

Takeyasu Ito, Chiba, and Teruaki Kuwajima, Osaka, both of Japan

Filed Apr. 19, 1984, Ser. No. 601,845

Claims priority, application Japan, Apr. 19, 1983, 58-69676

Int. Cl.³ C08K 3/08

U.S. Cl. 524—407 **5 Claims**

1. An anticorrosive metal surface pretreating composition comprising

(A) an emulsion of polymer particles comprising at least one α,β-ethylenically unsaturated monomer, bearing thereon, as protective colloid, an oligomer with hydrophylic groups comprising at least one α,β-ethylenically unsaturated monomer, the mean diameter of the particles being 0.1 to 3μ and the particles being formed as hard microparticles through internal gelation or having a glass transition point from 15° to 110° C., and

(B) a water soluble chromium compound obtained by partial reduction of CrO_3, 25 to 50% by weight of the total chromium content being trivalent, the weight ratio of said emulsion solid to metallic chromium being 1:10 5:1.

4,540,734

SAG CONTROL OF HIGH SOLID POLYURETHANE CLEARCOATS BY UREA THIXOTROPE/ACRYLIC MICROGEL SYSTEMS

William T. Short, Southfield; Robert A. Ottaviani, Washington, and Donald J. Hart, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 30, 1984, Ser. No. 635,555
Int. Cl.[3] C08L 75/00
U.S. Cl. 524—507 3 Claims

1. A sprayable high solids urethane clearcoat composition comprising

(1) a hydroxy-terminated urethane binder resin,

(2) a suitable cross-linking agent, and

(3) a flow control system consisting of a urethane-urea polymer and an organic filler of a polymer emulsion,

said flow control system improving the sagging property of the urethane clearcoat when applied to vertically oriented substrates, said urethane-urea polymer contained in the flow control system being a reaction product of an isocyanate-terminated prepolymer and an ethanolamine selected from the group consisting of monoethanolamine, diethanolamine, and triethanolamine, said polymer thus being capable of forming polar and hydrogen bonds with molecules of said binder resin for improving said sagging property but not entering into the cross-linking reactions with said binder resin molecules when said binder resin is cured by the cross-linking constituent.

4,540,735

METHOD OF PRODUCING LOW TEMPERATURE CURE LATEXES

David A. Borovicka, Sr., Parma, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Apr. 25, 1984, Ser. No. 603,692
Int. Cl.[3] C08L 33/26
U.S. Cl. 524—512 5 Claims

1. In a process for producing an aqueous coating composition comprising a glycoluril derivative and a reactive aqueous emulsion polymer wherein the coating composition is adapted to be heat cured to cross-link the glycoluril derivative with the reactive aqueous emulsion polymer, the improvement comprising:

heat reacting an aqueous polymeric mixture comprising by weight between about 5% and 55% glycoluril derivative and between 45% and 95% of a preformed reactive aqueous emulsion polymer at temperatures between about 60° C. and 90° C. for time sufficient less than two hours to partially heat react said glycoluril derivative with said reactive aqueous emulsion polymer to provide a minor amount of coreaction between the glycoluril derivative and the reactive aqueous emulsion polymer without gelling the polymeric mixture, the reactive aqueous emulsion polymer containing reactive hydroxyl, carboxyl, or acrylamide groups for coreacting with said glycoluril derivative.

5. The heat reacted product of the process of claim 1.

4,540,736

TEMPORARY PROTECTIVE COATING COMPOSITION OF ETHYLENE AND ACRYLIC ACID AND A BASE

Joris F. A. Herten, Relegem, and Emile M. Devroede, Buizingen, both of Belgium, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 17, 1982, Ser. No. 378,685
Int. Cl.[3] C08L 33/02
U.S. Cl. 524—556 9 Claims

1. A method comprising the steps of:

coating a strippable coating composition onto a substructure, the coating composition comprising water, a sufficient amount of a base to form a clear aqueous liquid composition, and from 0.1% to 20% by weight of a copolymer of ethylene and an emulsifiable alpha,beta-ethylenically unsaturated carboxylic acid having at least one carboxylic group and 3 to 8 carbon atoms, the copolymer having a number average molecular weight of from 500 to 5,000 and an acid number of at least 100 milligrams of potassium hydroxide necessary to neutralize one gram of the copolymer; and

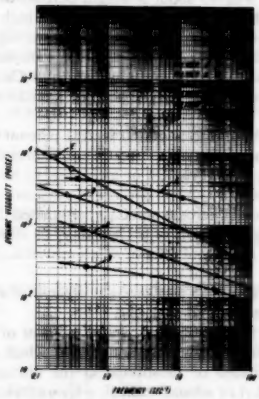
washing the coating composition off of the substructure with a basic solution.

4,540,737

METHOD FOR THE FORMATION OF COMPOSITE ARTICLES COMPRISED OF THERMOTROPIC LIQUID CRYSTALLINE POLYMERS AND ARTICLES PRODUCED THEREBY

Kurt F. Wissbrun, Short Hills, and Richard D. Orwoll, Mountainside, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,303
Int. Cl.[3] B32B 27/06; C08G 63/60; B29B 3/10
U.S. Cl. 524—599 16 Claims



1. In a method for the production of a composite reinforced article by pultrusion whereby said article is formed by causing at least one continuous length bundle of reinforcing fibers to advance into a crosshead extruder die, forcing a molten thermoplastic matrix polymer into said die under pressure to impregnate said at least one fiber bundle, and continuously extruding and pulling said at least one impregnated bundle through at least one exit orifice of said die to shape said at least one impregnated fiber bundle into said composite reinforced article, the improvement wherein said polymer comprises a thermotropic liquid crystalline polymer which possesses rheological properties such that a dynamic viscosity-frequency curve based on such characteristics has a negative slope of less than about 0.35 when measured at a frequency of 1 sec^{-1}.

4,540,738

ACRYLIC ADHESIVE COMPOSITION COMPRISING AN ALPHA AMINO PHOSPHONIC ACID OR SALT HAVING IMPROVED STABILITY

William D. Zimmermann, Farmington Hills, Mich., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 7, 1984, Ser. No. 679,159
Int. Cl.[3] C08K 5/53, 5/51
U.S. Cl. 524—707 6 Claims

1. An acrylic adhesive composition having improved stability, comprising:

a free radical polymerizable monomer selected from the group consisting of acrylate and methacrylate esters;

a free radical initiator; and

an amount of hydroquinone and

an amount of an alpha amino phosphonic acid or an alkali metal salt thereof effective to avoid premature gelation.

4,540,739

ADHESIVE POLYMER LATEX

Charles A. Midgley, Sarnia, Canada, assignor to Polysar Limited, Ontario, Canada

Filed Apr. 10, 1984, Ser. No. 598,926
Int. Cl.[3] C08L 93/04; C08K 5/09
U.S. Cl. 524—764 30 Claims

1. An aqueous based pressure sensitive adhesive having improved shear properties comprising a latex of a polymer having a Tg less than about 0° C., formed by emulsion polymerizing a monomeric mixture selected from the group comprising:

(a)

(i) from about 60–99.5 weight percent of a C_{1-8} alkyl or alkanol ester of acrylic or methacrylic acid; or a mixture thereof and

(ii) from 0.5 to about 40 weight percent of a C_{3-9} ethylenically unsaturated acid; and

(iii) from 0 up to about 5 weight percent of an amide of a C_{3-9} ethylenically unsaturated acid which amide may be unsubstituted or substituted at the nitrogen atom by a C_{1-8} alkyl or alkanol radical; a C_{3-9} ethylenically unsaturated aldehyde; or an anhydride of a C_{4-8} ethylenically unsaturated dicarboxylic acid; or a mixture thereof;

(b)

(i) from about 0 to about 60 weight percent of a vinyl aromatic monomer which may be unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine or bromine atom;

(ii) from 40 to 99 weight percent of a mixture comprising 100 to 50 weight percent of a C_{4-8} conjugated diolefin and 0 to 50 weight percent of a C_{1-8} alkyl or alkanol, or a C_{2-8} alkenyl or alkenol ester of a C_{3-9} ethylenically unsaturated acid;

(iii) from about 0.5 to 10 weight percent of a C_{3-9} ethylenically unsaturated acid; and

(iv) from 0 up to about 5 weight percent of an amide of a C_{3-9} ethylenically unsaturated acid which amide may be unsubstituted or substituted at the nitrogen atom by a C_{1-8} alkyl or alkanol radical; a C_{3-9} ethylenically unsaturated aldehyde; or an anhydride of a C_{4-8} ethylenically unsaturated dicarboxylic acid; or a mixture thereof; and

(c)

(i) from about 1 to about 40 weight percent of a C_{2-4} monoolefin monomer;

(ii) from about 60 to 99.5 weight percent of a C_{1-8} alkyl or alkanol ester of a C_{3-12} ethylenically unsaturated carboxylic acid or a C_{2-8} alkenyl or alkenol ester of a C_{1-12} saturated carboxylic acid or a mixture thereof; and

(iii) from about 0.5 to 10 weight percent of a C_{3-9} ethylenically unsaturated acid; and

(iv) from 0 up to about 5 weight percent of an amide of a C_{3-9} ethylenically unsaturated acid which amide may be unsubstituted or substituted at the nitrogen atom by a C_{1-8} alkyl or alkanol radical; a C_{3-9} ethylenically unsaturated aldehyde; or an anhydride of a C_{4-8} ethylenically unsaturated dicarboxylic acid or a mixture thereof;

which has been adjusted to a pH of equal to or greater than about 6 with an agent selected from hydroxides and salts of lithium, sodium, potassium and a mixture thereof.

4,540,740

CROSS-LINKED POLYMERIC MICROGEL PREPARED FROM POLYMERIZING EPOXY-CONTAINING MONOMER IN THE PRESENCE OF AN ACID

Kurt G. Olson, Gibsonia; Suryya K. Das, Pittsburgh, and Rostyslaw Dowbenko, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 4, 1983, Ser. No. 482,117
Int. Cl.[3] C08F 12/22
U.S. Cl. 524—811 7 Claims

1. A process for preparing emulsions of crosslinked polymeric particles comprising polymerizing a mixture of polymerizable ethylenically unsaturated monomers which contain greater than 2 percent by weight of a 1,2-epoxy group-containing ethylenically unsaturated monomer, the percentage by weight being based on total weight of polymerizable ethylenically unsaturated monomers, via aqueous emulsion polymerization techniques in the presence of acid having a pKa of −10 to 4 and in which the aqueous medium has a pH of less than 2.5, the 1,2-epoxy group-containing ethylenically unsaturated monomer and acid being present in amounts sufficient to form crosslinked polymeric particles.

4,540,741

NEW UNSATURATED POLYESTER-BASED PRODUCTS

Giovanni Corrado, 190, Via Gentile da Mogliano, Rome, Italy

Filed May 23, 1984, Ser. No. 613,345
Claims priority, application Italy, May 24, 1983, 21236 A/83
Int. Cl.[3] C08G 63/52
U.S. Cl. 525—43 16 Claims

1. A ready to use unsaturated polyester resin alkyd having an acid number in the range of 30 to 60, a viscous behavior at room temperature, a viscosity not exceeding 300,000 cps at 45° C. and viscosity not exceeding 500 cps at 25° C. when diluted with styrene to a content of 31% by weight.

4,540,742

GRAFT COPOLYMERS AND PROCESS FOR THEIR PREPARATION

Yoshihisa Okamoto, Sagamore Hills, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

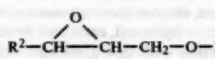
Filed Nov. 12, 1982, Ser. No. 440,916
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.[3] C08F 251/02; C08E 261/12; C08G 59/00
U.S. Cl. 525—61 22 Claims

1. A graft copolymer from a polymer having a hydroxyl-containing backbone (HCB) having the structure $R^1(OH)_n$ wherein n represents an integer in the range from 1 to about 400, wherein from 1 to about 200 are pendant OH groups, the remaining groups, if any, being terminal, and, an oxirane monomer, said graft copolymer having the structure

$$R^1[O[A-_a-H]_b \quad \text{(III)}$$

wherein, R^1 represents the residue of said HCB;

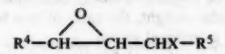
A represents a single ring-openable oxirane monomer selected from the group consisting of (i) an aliphatic or aromatic glycidyl ether having the structure



(I)

wherein R^2 and R^3 is each independently selected from

the group consisting of hydrogen, alkyl having from 1 to about 40 carbon atoms, haloalkyl, alkenyl having from 2 to about 40 carbon atoms, haloalkenyl, alkoxyalkyl having from 1 to about 40 carbon atoms, aryl(Ar) or substituted aryl(Ar-Q), wherein Q is selected from the group consisting of alkyl, haloalkyl each having from 1 to about 10 carbon atoms, alkenyl and haloalkenyl each having from 2 to about 10 carbon atoms; and, (ii) a haloalkyl epoxide having the structure



(II)

wherein X is a halogen atom and R^4 and R^5 is each independently selected from the group consisting of hydrogen and alkyl having from 1 to about 4 carbon atoms;

so that the molecular weight of the resulting graft copolymer is directly proportional to the amount of monomer converted; and,

a represents an integer in the range from about 1 to about 100;

b represents an integer in the range from 1 to about 400;

so that the molecular weight of each grafting chain of said graft copolymer is in the range from about 100 to about 10,000, and the molecular weight of the overall graft copolymer is in the range from about 2000 to about 500,000.

13. A process for the manufacture of a graft copolymer having the structure (III) by grafting from a polymer having a hydroxyl-containing backbone (HCB) with an oxirane monomer, which process comprises,

(i) polymerizing, said HCB with a single oxirane monomer selected from the group consisting of an acyclic glycidyl ether, a cyclic glycidyl ether, and a haloalkyl epoxide, in the presence of a catalytic amount from about 0.001 part to about 1 part per 100 parts by wt of oxirane reactants, of a catalyst selected from the group consisting of an HMF_6 acid, and, an oxonium salt of the HMF_6 acid, wherein M is an element selected from the group consisting of phosphorus, arsenic and antimony, at a temperature in the range from about 0° C. to about 150° C., at ambient or slightly elevated pressure, and,

(ii) recovering said graft copolymer which is formed in an amount directly proportional to the conversion of monomer.

4,540,743

ACYLATION OF POLYVINYL ALCOHOLS, AND PHOTOPOLYMERIZABLE AND/OR PHOTOCROSSLINKABLE MIXTURES CONTAINING PRODUCTS THUS ACYLATED

Guenther Schulz, Ludwigshafen, and Guenther Wallbillich, Schifferstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

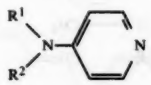
Filed Jun. 25, 1984, Ser. No. 624,094

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322993

Int. Cl.³ C08F *8/10*

U.S. Cl. 525—61 **13 Claims**

1. A process for the acylation of a polyvinyl alcohol comprising esterifying the polyvinyl alcohol with a carboxylic acid derivative suitable for acylation reactions, in the heterogeneous phase in an aprotic dispersant, in the presence of a pyridine derivative catalyst of the formula I



(I)

where R^1 and R^2 are each alkyl, or R^1 and R^2 together form an alkylene radical.

4,540,744

BUTADIENE-BASE POLYMER AND A PROCESS FOR PRODUCING THE SAME

Noboru Oshima, Suzuka; Isamu Shimizu, Kameyama, and Yoshito Yoshimura, Yokkaichi, all of Japan, assignors to Bridgestone Tire Company Limited and Japan Synthetic Rubber Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 545,288, Oct. 25, 1983, abandoned. This application Feb. 12, 1985, Ser. No. 701,438

Claims priority, application Japan, Oct. 27, 1982, 57-187477

Int. Cl.³ C08F *8/42*

U.S. Cl. 525—332.9 **17 Claims**

1. A vulcanized rubber composition comprising a butadiene-base polymer containing a branched polymer through a tin-carbon bond at a branching point, which is produced by polymerizing 1,3-butadiene alone or 1,3-butadiene and an aromatic vinyl compound in a hydrocarbon solvent in the presence of a Lewis base using an organolithium compound as an initiator and satisfies the following requirements:

(1) the content of said aromatic vinyl compound in the butadiene-base polymer is 0–40% by weight;

(2) the content of a vinyl bond-containing butadiene unit in the total butadiene unit of the butadiene-base polymer is 30–90%;

(3) the content of the branched polymer in the butadiene-base polymer is at least 30% by weight; and

(4) the content of a component having a molecular weight of less than 100,000 as polystyrene in the molecular weight distribution as measured by gel permeation chromatography is 10–20% by weight.

4,540,745

ALLYL STYRYL PYRIDINES AND PYRAZINES AND POLYMERS THEREOF

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 19, 1984, Ser. No. 632,342

Int. Cl.³ C08F *283/06*

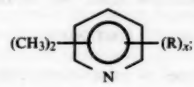
U.S. Cl. 525—401 **10 Claims**

1. A thermosettable allylated product which comprises the resinous reaction product of

(A) at least one of

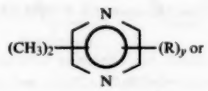
(1) one or more pyridine compounds represented by the formula

I.



(2) one or more pyrazine compounds represented by the formula

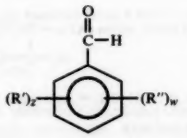
II.



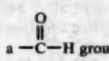
(3) a mixture of (1) and (2); with

(B) a substituted aromatic aldehyde represented by the formula

III.



wherein each R is independently hydrogen, hydroxyl, methyl or ethyl; each R' is independently a hydroxyl or a



each R'' is independently hydrogen, methyl or ethyl; x has a value of 3; y has a value of 2; z has a value of 1 or 2; w has a value of 3 or 4; the sum of z and w has a value of 5; and with the proviso that at least one of R or R' is a hydroxyl group to provide a hydroxyl functional precursor which is then reacted with

(C) an allylating agent whereby at least about one percent of the rings of the reaction product of (A) and (B) possess allyl groups.

4,540,746

POLYAMIDE FIBER

Winston J. Roberts, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 566,868, Dec. 29, 1983,. This application Oct. 19, 1984, Ser. No. 662,582

Int. Cl.[3] **C08L** *77/00;* **C08G** *65/00*

U.S. Cl. 525—408 **8 Claims**

1. A polyamide fiber comprising, as a distinct phase, from about 0.4 to about 10 weight percent, based upon weight of polyamide, of an additive mixture consisting essentially of

(a) from 75 to 95 percent by weight of a low molecular weight poly(alkylene ether) component having an average molecular weight from about 1000 to about 6000; and

(b) from 25 to 5 percent by weight of a high molecular weight poly(alkylene ether) component having an average molecular weight from about 70,000 to about 1,000,000.

4,540,747

BLOCK COPOLYMER

Takeo Saegusa, 8-22, Tojiin Kitamachi, Kita-ku, Kyoto; Shiro Kobayashi, Kyoto, and Yasuhiro Moriuchi, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Takeo Saegusa, Kyoto, both of, Japan

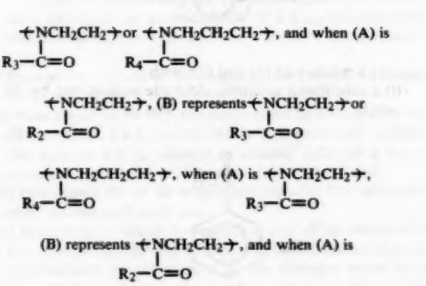
Filed May 29, 1984, Ser. No. 615,096

Claims priority, application Japan, Jun. 10, 1983, 58-104753; Jun. 10, 1983, 58-104754

Int. Cl.[3] **C08L** *79/04*

U.S. Cl. 525—410 **9 Claims**

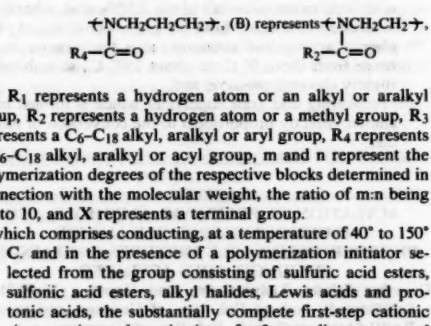
1. A block copolymer of poly(N-formylethyleneimine) or poly(N-acetylethyleneimine) with poly(N-acylethyleneimine) or poly(N-acylpropyleneimine) having a molecular weight of 500 to 50,000 represented by the formula



(1)

and R_1 represents a hydrogen atom or an alkyl or aralkyl group, R_2 represents a hydrogen atom or a methyl group, R_3 represents a C_6–C_{18} alkyl, aralkyl or aryl group, R_4 represents a C_6–C_{18} alkyl, aralkyl or aryl group, m and n represent the polymerization degrees of the respective blocks determined in connection with the molecular weight, the ratio of m:n being 0.1 to 10, and X represents a terminal group.

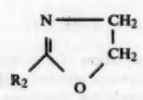
7. A method for producing a water-soluble block copolymer of poly(N-formylethyleneimine) or poly(N-acetylethyleneimine) with poly(N-acylethyleneimine) or poly(N-acylpropyleneimine) having a molecular weight of 500 to 50,000 represented by the formula



(1)

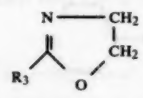
and R_1 represents a hydrogen atom or an alkyl or aralkyl group, R_2 represents a hydrogen atom or a methyl group, R_3 represents a C_6–C_{18} alkyl, aralkyl or aryl group, R_4 represents a C_6–C_{18} alkyl, aralkyl or acyl group, m and n represent the polymerization degrees of the respective blocks determined in connection with the molecular weight, the ratio of m:n being 0.1 to 10, and X represents a terminal group.

which comprises conducting, at a temperature of 40° to 150° C. and in the presence of a polymerization initiator selected from the group consisting of sulfuric acid esters, sulfonic acid esters, alkyl halides, Lewis acids and protonic acids, the substantially complete first-step cationic ring-opening polymerization of a 2-oxazoline compound of the formula



(2)

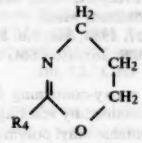
wherein R_2 represents a hydrogen atom or a methyl group, or a 2-oxazoline compound of the formula



(3)

wherein R_3 represents a C_6–C_{18} alkyl, aralkyl or aryl

group, or a 2-substituted-5,6-dihydro-4H-1,3-oxazine compound of the formula



(4)

wherein R_4 represents a C_6–C_{18} alkyl, aralkyl or aryl group, the amount of the initiator being 0.1 to 25 mole% based on the compound (2), (3) or (4), and then when said first-step cationic ring-opening polymerization is the polymerization of the compound (2), conducting the second-step cationic ring-opening polymerization of the compound (3) or (4) at a temperature of 40° to 150° C.; or when said first-step cationic ring-opening polymerization is the polymerization of the compound (3) or (4), conducting the second-step cationic ring-opening polymerization of the compound (2) at a temperature of 40° to 150° C.

9. A surface active agent comprising: the block copolymer represented by formula (1) according to claim 1, wherein when (A) is

m is equal to or larger than n, or when (B) is

m is equal to or smaller than n, and a carrier therefor.

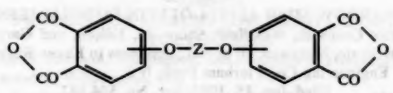
4,540,748

POLYETHERIMIDES

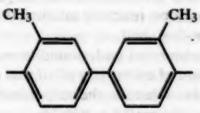
Markus Matzner, Edison, N.J., and Donald M. Papuga, Danbury, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1984, Ser. No. 626,102
Int. Cl.[3] C08G *73/10, 73/14*
U.S. Cl. 525—420 **7 Claims**

1. A polyetherimide produced by the reaction of a dianhydride of the formula:



wherein Z is a member of the class consisting of



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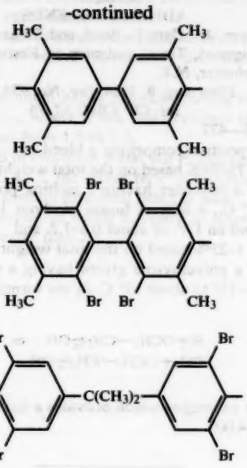
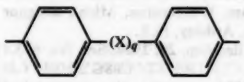
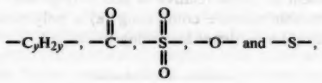


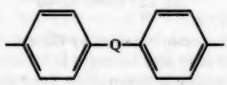
and (2) divalent organic radicals of the general formula:



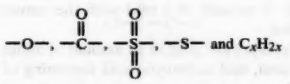
where X is a member selected from the class consisting of divalent radicals of the formulas,



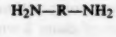
where q is 0 or 1, y is a whole number from 1 to 5, and R is a divalent organic radical selected from the class consisting of (1) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (2) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$, alkylene terminated polydiorganosiloxane, and (3) divalent radicals included by the formula



where Q is a member selected from the class consisting of



where x is a whole number from 1 to 5 inclusive, and a diamine of the formula:



wherein R is an aliphatic polyamide, aliphatic aromatic polyamide, heterocyclic polyamide, aromatic polyether or poly(ether ketone) having a molecular weight ≧1500.

4,540,749

ADHESIVE BLENDS

Max F. Meyer, Jr.; Gary L. Bond, and Richard L. McConnell, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1984, Ser. No. 639,159
Int. Cl.[3] C08G *63/76*
U.S. Cl. 525—437 11 Claims

1. A composition comprising a blend of

(a) about 75–99% based on the total weight of the composition of a polyester having a melting point of about 80° C.–180° C., a heat of fusion of about 1–10 calories per gram and an I.V. of about 0.4–1.2, and

(b) about 1–25% based on the total weight of the composition of a polyethylene glycol having a melting point of about −15° to about 67° C. of the formula

$$H\text{+}OCH_2\text{—}CH_2\text{+}_{\overline{n}}OH \quad \text{or} \quad CH_3\text{+}OCH_2\text{—}CH_2\text{+}_{\overline{n}}OH$$

wherein n is an integer which provides a molecular weight of about 200–14,000.

4,540,750

DIETHYL TOLUENE DIAMINE HARDENER SYSTEMS

Nancy M. Ham, Williamston, Mich., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 24, 1984, Ser. No. 653,417
Int. Cl.[3] C08G *59/64*
U.S. Cl. 525—504 19 Claims

1. A hardener for epoxy resins comprising the adduct obtained from the reaction of diethyl toluene diamine and a polyepoxide having a functionality of at least two, said diamine being present in excess relative to said polyepoxide.

7. A curable mixture comprising (a) a polyepoxide compound and (b) a hardener according to claim 1.

4,540,751

HIGH SOLIDS, HIGH HEAT RESISTANT POLYESTER RESINS AND COATING COMPOSITIONS CONTAINING THE SAME

Conrad L. Lynch, Metuchen, and Michael A. Tobias, Bridgewater, both of N.J., assignors to The Valspar Corporation, Minneapolis, Minn.

Filed May 14, 1984, Ser. No. 610,211
Int. Cl.[3] C08G *12/40*
U.S. Cl. 525—517.5 8 Claims

1. The polyester resin obtained by the esterification of:

(a) a saturated fatty acid having 8 to 18 carbon atoms in an amount by weight between about 3 and about 8 percent of the total weight of (a), (b) and (c);

(b) a polyol in an amount by weight between about 40 and about 50 percent, said polyol consisting of between about 55 and 75 percent of a triol with the remainder being a diol; and

(c) a polycarboxylic acid in an amount of about 45 to about 55 percent, said carboxylic acid consisting of between 65 and 75 percent of an aromatic polycarboxylic acid with the remainder being an aliphatic polycarboxylic acid having from 4 to 10 carbon atoms, said polyester resin having a hydroxyl number from about 75 to about 175.

6. A high temperature-resisting coating composition obtained by the reaction of the polyester resin of claim 1 with an aminoplast resin in an amount from about 7 to about 30 percent by weight of the weight of said polyester and aminoplast resins and a solvent therefor.

4,540,752

EPOXY COATING COMPOSITIONS WITH IMPROVED WEATHERABILITY

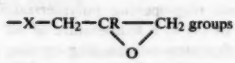
Russell T. McFadden, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 17, 1984, Ser. No. 581,469
Int. Cl.[3] C08F *283/10*; C08G *59/00*
U.S. Cl. 525—531 6 Claims

1. A solvent soluble epoxy-containing composition which comprises the product obtained by reacting in the presence of a suitable quantity of a suitable vinyl polymerization catalyst so as to effect polymerization

(A) the reaction product obtained by reacting in the presence of a suitable quantity of a suitable catalyst

(1) at least one material having from greater than 1 to about 4



per molecule wherein each R is independently hydrogen or a monovalent hydrocarbon group having from 1 to about 4 carbon atoms; X is —O—, —S— or

and wherein said material has an epoxide equivalent weight of from about 150 to about 400; and

(2) at least one of acrylic acid or methacrylic acid;

wherein components (1) and (2) are present in a quantity which provides an equivalent ratio of acid groups from component (2) to epoxy groups from component (1) of from about 0.1:1 to less than about 0.5:1; and

(B) at least one monomer having at least one polymerizable ethylenically unsaturated group per molecule and which optionally contains a hydroxyl or an epoxide group; and

wherein components (A) and (B) are employed in quantities such that the weight ratio of vinyl monomers to epoxy compound varies from about 0.4:1 to about 2.5:1.

4,540,753

NARROW MWD ALPHA-OLEFIN COPOLYMERS

Charles Cozewith, Westfield; Shiaw Ju, Edison, and Gary W. VerStrate, Matawan, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 15, 1983, Ser. No. 504,582
Int. Cl.[3] C08F *10/00*
U.S. Cl. 526—88 24 Claims

1. In a polymerization process for producing copolymer in the form of copolymer chains, from a reaction mixture comprised of catalyst, ethylene, and at least one other alpha-olefin monomer, the improvement which comprises conducting the polymerization:

(a) in at least one mix-free reactor,

(b) with essentially one active catalyst species,

(c) using at least one reaction mixture which is essentially transfer agent-free, and

(d) in such a manner and under conditions sufficient to initiate propagation of essentially all of said copolymer chains simultaneously, wherein the copolymer chains are dispersed within the reaction mixture.

4,540,754

PROCESS FOR PRODUCING HIGH MOLECULAR WEIGHT ACRYLONITRILE POLYMERS

Toshiyuki Kobashi, and Shoyo Takagi, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Mar. 26, 1984, Ser. No. 593,240
Claims priority, application Japan, Apr. 13, 1983, 58-66243
Int. Cl.[3] C08F 2/00
U.S. Cl. 526—88 9 Claims

1. A method of producing a high molecular weight acrylonitrile polymer having a weight average molecular weight not less than 400,000, characterized by suspension-polymerizing at a temperature of from 20° to 80° C., acrylonitrile alone or a monomer mixture compound of more than 85 weight % acrylonitrile and at least one other ethylenically unsaturated monomer which forms the remainder, in an aqueous medium containing a water-soluble polymer and an oil-soluble radical initiator, under the conditions that an acrylonitrile concentration higher than 9 weight % is maintained in the polymerization system, and wherein the effect of stirring imparted to the polymerization system is 1–10 KWH/m^3 in terms of the power required for stirring.

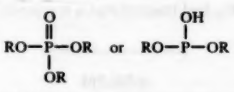
4,540,755

INCLUSION OF OXYGEN IN THE POLYMERIZATION OF OLEFINS

Harry W. Mayhew, Cincinnati; Richard J. French, Loveland, and Louis J. Rekers, Wyoming, all of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,733
Int. Cl.[3] C08F 4/78
U.S. Cl. 526—100 33 Claims

1. A process for the polymerization of olefins said process comprising contacting an olefin admixed with an oxygen-containing gas with a catalyst prepared by depositing on a solid inorganic support material the reaction product of chromium trioxide and an organophosphorus compound having the formula:



wherein R is alkyl, aralkyl, aryl, cycloalkyl, or hydrogen with the proviso that at least one R group is other than hydrogen and heat-activating the resultant catalyst and wherein the oxygen-containing gas is present in amounts of from about 0.1 to about 10 ppm based on total feed to the reactor.

4,540,756

PROCESS FOR MAKING LOW CRYSTALLINITY POLYOLEFINS

John H. Johnson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 547,695, Nov. 1, 1983, abandoned. This application May 21, 1984, Ser. No. 612,489
Int. Cl.[3] C08F 4/44; C01F 11/00
U.S. Cl. 526—124 17 Claims

1. A process for the production of high molecular weight polyolefins having a degree of crystallinity less than about 25%, which process comprises polymerizing at least one 1-olefin containing at least 3 carbon atoms or a mixture of at least one of said olefins with up to about 67 weight % of ethylene in an inert liquid hydrocarbon diluent at a temperature ranging from about 25° C. to about 90° C. in the presence of a catalytic amount of a catalyst system consisting essentially of

(a) a hydrocarbon soluble transition metal component derived by contacting in an inert liquid hydrocarbon

(1) a soluble, halide free magnesium-carboxylate having the general formula $Mg(OOCR')_2$ where each R′ is alike or different and is derived from a carboxylic acid containing at least 2 carbon atoms with

(2) a soluble salt of a transition metal selected from the group consisting of tetravalent titanium, zirconium and hafnium, and

(b) an alkylaluminum halide activator having the general formula R_nAlX_{3-n} where R is a 1 to 18 carbon alkyl group and n is a number from 1.5 to 2.5,

the molar ratio of transition metal salt to magnesium carboxylate being 0.003 to 3, the molar ratio of alkylaluminum halide activator to transition metal salt being at least 1 and the molar ratio of alkylaluminum halide activator to magnesium carboxylate being greater than 2.5.

4,540,757

POLYMERIZATION AND CATALYST

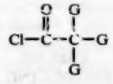
Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1984, Ser. No. 656,392
Int. Cl.[3] C08F 4/02, 10/02
U.S. Cl. 526—128 15 Claims

1. A process for the production of ethylene polymers having broad molecular weight distribution, which comprises contacting ethylene and mixtures of ethylene with minor amounts of at least one higher mono-1-olefin under polymerization conditions with a catalyst composition comprising:

(a) a magnesium/titanium-containing catalyst component (A)

supported on a milled blend of at least two different silica-containing materials which have different MI (polymer melt index) potentials in which at least two of the silica-containing materials have been chemically treated with different chemical agents with the further proviso that one of the silicas is reacted with a silating compound selected from the group consisting of (1) chlorosilanes having the formula $R_c^2SiCl_{4-c}$ in which R^2 is phenyl or alkyl group of 1 to about 6 carbon atoms, and c is an integer of 1,2 or 3 and (b 2) diphenyl silanediol and at least one other of the silicas is reacted with a carboxylic acid chloride of the formula



in which each G is selected from the group consisting of chlorine, alkyl of 1 to about 3 carbon atoms, hydrogen, and phenyl, with at least one G being chlorine, and

(b) an organolauminum cocatalyst component (B)

R''_nAlX_{n-3},

wherein R″ is a hydrocarbon radical having from 1 to about b 20 carbon atoms, n is an integer of 0 to 3, and X is halogen or hydrogen.

4,540,758

POLYMERIZATION OF ETHYLENE WITH SUPPORTED π ALLYL CHROMIUM COMPLEXES

Robert N. Johnson, Basking Ridge, and Frederick J. Karol, Somerset, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 385,304, Aug. 3, 1973, Pat. No. 4,054,538, which is a division of Ser. No. 193,144, Oct. 27, 1971, Pat. No. 3,836,595, which is a continuation-in-part of Ser. No. 878,566, Nov. 20, 1969, abandoned, which is a continuation-in-part of Ser. No. 784,478, Dec. 17, 1968, abandoned. This application Sep. 15, 1975, Ser. No. 613,233

The portion of the term of this patent subsequent to Sep. 15, 1996, has been disclaimed.

Int. Cl.³ C08F *4/02, 10/02*

U.S. Cl. 526—130 **8 Claims**

1. A process for the homopolymerization of ethylene or the copolymerization of ethylene with at least one C_3 to C_{10} alpha olefin or diolefin which comprises contacting the monomer charge with a chromium metal catalyst composition which is the colored insoluble product obtained by adsorbing a chromium metal complex containing at least part of the chromium in the +2 valence state and which contains allyl hydrocarbon radicals as the only ligands and is obtained by reduction of a π allyl chromium III compound, with an inert inorganic oxide support which has —OH groups on its surface and which is free from adsorbed water.

4,540,759

POLYMERIZATION OF VINYL CHLORIDE IN THE PRESENCE OF A CATALYST SOLUBILIZED PRIOR TO EXPOSURE TO MONOMER

Gilbert Sielfeld, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 409,796

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132888

Int. Cl.³ C08F *2/20*

U.S. Cl. 526—200 **15 Claims**

1. In a process for producing a vinyl chloride polymer or copolymer by suspension polymerization in the presence of a monomer-soluble catalyst and a suspension stabilizer, comprising carrying out the polymerization at a temperature of 45°–75° C. in the presence of 0.4–8.0% by weight of an ethylene/vinyl acetate copolymer having a vinyl acetate content of 38% to 55% by weight, and a viscosity number of 95–210 ml/g, measured in toluene in a concentration of 0.005 g/cm³ at 25° C.; the improvement wherein the catalyst is dissolved in a reaction compatible solvent when added to the polymerization charge and wherein the suspension stabilizer comprises 0.05–1.5% by weight, based on the amount of monomer or monomer mixture, of a methylcellulose having a methoxy substitution degree of 22–34% and a viscosity of 10–5,000 m Pa s, measured in a 2% by weight aqueous solution and measured according to the Brookfield method at 20° C. and 20 rpm, or a methylhydroxypropylcellulose with a methoxy substitution degree of 20–32% and a hydroxy-propoxy substitution degree of 2–9% and a viscosity of 25–5,000 m Pa s, measured in a 2% by weight aqueous solution using a Ubbelohde capillary viscometer at 20° C.

4,540,760

PROCESS FOR PRODUCING POLYMERS OF MONOALLYLAMINE

Susumu Harada; Kiyoshi Shimizu, and Hajime Serizawa, all of Koriyama, Japan, assignors to Nitto Boseki Co. Ltd., Fukushima, Japan

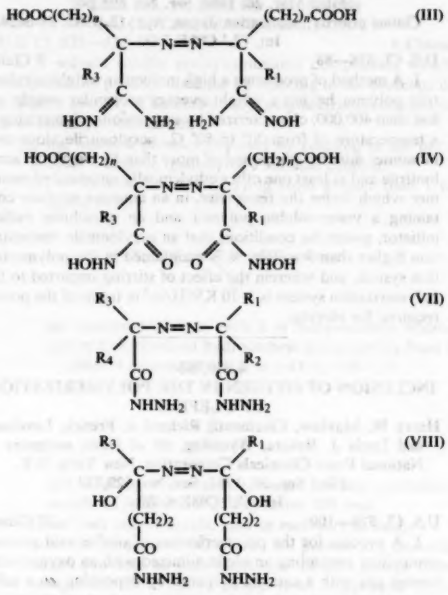
Filed Nov. 7, 1984, Ser. No. 669,319

Claims priority, application Japan, Jan. 11, 1984, 59-3150; Sep. 1, 1984, 59-183601

Int. Cl.³ C08F *4/04, 26/02*

U.S. Cl. 526—211 **16 Claims**

1. A process for producing a polymer of monoallylamine or a salt thereof which comprises polymerizing an inorganic acid salt of monoallylamine in a polar solvent in the presence of an azo type initiator selected from azo compounds represented by formulae (III), (IV), (VII) and (VIII):



wherein R_1, R_2, R_3 and R_4 each represents, which may be the same or different, a hydrocarbon group; R_1 and R_2 or/and R_3 and R_4 may be combined to complete a ring together with the carbon atom attached thereto; and n represents 0 or an integer of 1 to 4.

4,540,761

OXYGEN-PERMEABLE HARD CONTACT LENS

Kazunori Kawamura, Akishima; Shinichi Yamashita, Ohme; Yuichi Yokoyama, Kunitachi, and Makoto Tsuchiya, Tokyo, all of Japan, assignors to Hoya Lens Corporation, Kowada, Japan

PCT No. PCT/JP83/00237, § 371 Date Mar. 19, 1984, § 102(e) Date Mar. 19, 1984, PCT Pub. No. WO84/00619, PCT Pub. Date Feb. 16, 1984

PCT Filed Jul. 25, 1983, Ser. No. 598,283

Claims priority, application Japan, Jul. 27, 1982, 57-130836

Int. Cl.³ C08F *214/18;* G03B *21/46*

U.S. Cl. 526—245 **1 Claim**

1. An oxygen-permeable hard contact lens made of oxygen-permeable, transparent, high molecular weight material produced by polymerizing in a mold a composition comprising:

(a) 30 to 50% by weight of an alkyl (meth)acrylate wherein said alkyl group has from 1 to 4 carbon atoms;

(b) 10 to 40% by weight of a fluorine-containing monomer which is at least one perfluoroalkyl (meth)acrylate selected from the group consisting of trifluoroethyl (meth) acrylate, pentafluoroisopropyl (meth)acrylate, heptafluorobutyl (meth)acrylate and hexafluoroisopropyl (meth)acrylate;

(c) 10 to 35% by weight of a silicone (meth)acrylate which is at least one member selected from the group consisting of tris(trimethylsiloxy)silylpropyl (meth)acrylate, triphenyldimethyldisiloxanylmethyl (meth)acrylate, pentamethyldisiloxanylmethyl (meth)acrylate, tert-butyltetramethyldisiloxanylethyl (meth)acrylate and methyldi(trimethylsiloxy)silylpropylglyceryl (meth)acrylate;

(d) 5 to 15% by weight of at least one unsaturated carboxylic acid monomer selected from the group consisting of acrylic acid and methacrylic acid; and

(e) 0.1 to 15% by weight of at least one monomer selected from the group consisting of (i) di(meth)acrylates of ethylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, propylene glycol or butylene glycol and (ii) trimethylolpropane tri(meth)acrylate.

4,540,762

COPOLYMERS OF SODIUM STYRENE SULFONATE AND SODIUM-N-(4-SULFOPHENYL)-MALEIMIDE

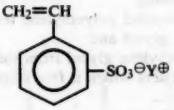
S. Richard Turner, Pittsford, N.Y., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 416,938, Sep. 13, 1982, abandoned. This application Dec. 12, 1983, Ser. No. 560,222

Int. Cl.³ C08F *22/40*

U.S. Cl. 526—262 **3 Claims**

1. A water soluble, solid alternating copolymer of about 50 mol. % sodium-N-(4-sulfophenyl)-maleimide monomer units and a metal or amine neutralized sulfonate monomer units characterized by the formula:



wherein $Y^{\oplus}$ is a cation selected from Groups IA, IIA, IB or IIB of the Periodic Table or an amine of the formula:

where R_1, R_2 and R_3 are aliphatic groups of C_1 to C_{12} or hydrogen.

4,540,763

POLYMERS DERIVED FROM POLY(ARYLCYCLOBUTENES)

Robert A. Kirchhoff, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 14, 1984, Ser. No. 650,590

Int. Cl.³ C08F *132/08, 232/08*

U.S. Cl. 526—281 **32 Claims**

1. A polymeric composition which comprises the reaction product prepared by exposing one or more poly(arylcyclobutenes) which comprise two or more aryl moieties with one or more cyclobutane rings fused to each aryl moiety, wherein the aryl moieties are directly bonded to one another or are connected by a bridging member wherein the bridging member is (1) a polyvalent inorganic radical or (2) a polyvalent organic radical, to temperatures at which the poly(arylcyclobutenes) undergo polymerization.

4,540,764

REACTION PRODUCT OF TUNGSTEN CARBONYL/PYRROLIDINE COMPLEX WITH A FURAN ACID

P. Anthony Hinman, Torrance, Calif., assignor to Hitco, Newport Beach, Calif.

Filed Mar. 29, 1983, Ser. No. 479,926

Int. Cl.³ C08G *79/00*

U.S. Cl. 528—9 **6 Claims**

1. The thermoplastic/thermosetting reaction product of (1) 2-furanacrylic acid or 2-furoic acid and (2) a metal complex which is a reaction product of tungsten carbonyl with pyrrolidine, said product being a multi-cycle reimpregnation polymer.

4,540,765

POLYURETHANES CONTAINING PERFLUOROALKYL GROUPS AND A PROCESS FOR THEIR PRODUCTION

Ulrich Koemm, Cologne, and Klaus Geisler, Bonn, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 612,095

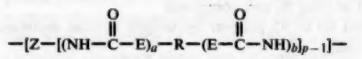
Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319368

Int. Cl.³ C08G *18/38*

U.S. Cl. 528—45 **6 Claims**

1. A polyurethane containing perfluoroalkyl ligands and having as recurring structural units

and optionally,

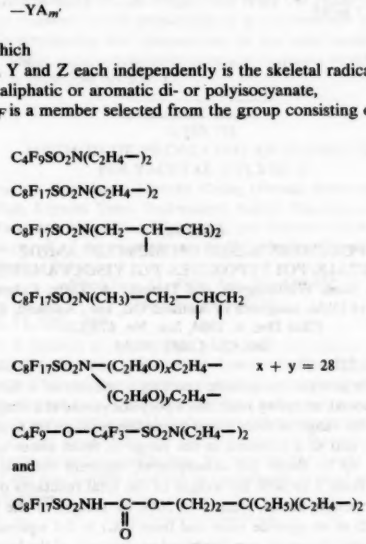


with chain ends of the formula

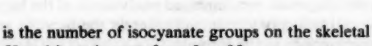
in which

X, Y and Z each independently is the skeletal radical of an aliphatic or aromatic di- or polyisocyanate,

R_F is a member selected from the group consisting of



and



n is the number of isocyanate groups on the skeletal radical X and is an integer from 2 to 25,

A is an isocyanate group protected by a blocking agent,

m is the number of blocked isocyanate groups A on the skeletal radical Y and is an integer from 1 to 5,

E is O, S or —NR'—,

R' is H, alkyl or aryl,

R is the radical of a compound containing at least two alcohol, amine and/or thiol groups,

a and b are the number of —OH, —NR'H or —SH functions in the alcohols, amines or thiols $R(EH)_{(a+b)}$ used and each is an integer from 0 to 10, and

p is the number of isocyanate groups on the skeletal radical Z and is an integer from 0 to 25.

4,540,766

THERMOSETTING HIGH SOLIDS SOLVENT-BASED POLYESTER-URETHANE ONE-COMPONENT COATING COMPOSITIONS

Wen-Hsuan Chang, Gibsonia; Ronald R. Ambrose, Allison Park; David T. McKeough, Gibsonia; Samuel Porter, Jr., Natrona Heights, and Delano R. Eslinger, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 3, 1983, Ser. No. 538,631
Int. Cl.³ C08G *18/80*
U.S. Cl. 528—45 25 Claims

1. A high solids, solvent-based, thermosetting, one-component coating composition having a sprayability of at least 40 percent, which when cured is flexible and hard in that when the coating composition is deposited on an elastomeric substrate and cured, the coated substrate can be bent around a ½-inch mandrel with the coating facing outwardly and the coating exhibits substantially no breaks or cracks when tested at 35° F.; and in that when the coating composition is deposited on a metallic substrate and cured, the coated substrate has a Sward hardness of at least 14; said coating composition contains a film-former comprising a polyester-urethane polyol and a curing agent; the polyester-urethane polyol has a hydroxyl value of at least 50 and comprises:

(A) about 60 to 95 percent by weight acyclic moieties, and optionally

(B) up to about 30 percent by weight cyclic moieties;

the sum of the weight percentage of cyclic moieties and the weight percentage of urethane moieties multiplied by 3 is from about 15 to 65.

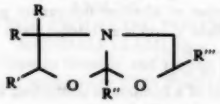
4,540,767

POLYMERS BASED ON BICYCLIC AMIDE ACETALS/POLYEPOXIDES/POLYISOCYANATES

Anil B. Goel, Worthington, and Timothy A. Tufts, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 4, 1984, Ser. No. 678,133
Int. Cl.³ C08G *18/30*
U.S. Cl. 528—60 6 Claims

1. The process comprising reacting a mixture of a bicyclic amide acetal, an epoxy resin and a polyisocyanate at a temperature in the range of from about room temperature up to about 200° C. and at a pressure in the range of from about atmospheric up to about 100 atmospheres, wherein there is employed from 1 to 50% by weight of the total reactants of the bicyclic amide acetal, from 5 to 50% by weight of the total reactants of an eposide resin and from 0.8:1 to 3:1 equivalents of the polyisocyanate per combined equivalents of the bicyclic amide acetal and epoxy resin and wherein the bicyclic amide acetal corresponds to the formula



wherein R, R' and R''' each independently represents hydrogen or an alkyl, an aryl, alkaryl or an ether group having from 1 to 18 carbon atoms and R'' represents an alkyl group having from 1 to 18 carbon atoms or an aralkyl group having from 7 to 20 carbon atoms.

4,540,768

RIM ELASTOMERS MADE FROM TEREPHTHALATE POLYESTER POLYOL DERIVED POLYMER POLYOLS

George P. Speranza; Michael Cuscurida, and Richard J. G. Dominguez, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 9, 1984, Ser. No. 658,944
Int. Cl.³ C08G *18/14, 18/42;* B28B *1/24*
U.S. Cl. 528—79 20 Claims

1. A reaction injection molded elastomer made by reacting in a closed mold ingredients comprising a polyol derived from recycled polyethylene terephthalate, an amine terminated chain extender and a polyisocyanate wherein

the polyol derived from recycled polyethylene terephthalate is a polymer polyol made by reacting

a. a liquid terephthalic polyester polyol derived from recycled polyethylene terephthalate, with

b. an organic polyisocyanate in the presence of

c. a polyether polyol solvent.

16. A method of making a reaction injection molded elastomer comprising reacting in a closed mold a polymer polyol, an amine terminated chain extender and a polyisocyanate, where the polymer polyol is made by the process comprising reacting

a. a liquid terephthalic polyester polyol produced by the process comprising

(1) reacting recycled polyethylene terephthalate with an oxyalkylene glycol and

(2) stripping ethylene glycol from the reaction to give a mixture of esters which is free from solids upon standing, with

(b) an organic polyisocyanate in the presence of

(c) a polyether polyol solvent.

4,540,769

PREPARATION OF N-GLYCIDYL COMPOUNDS

Bryan Dobinson, and Michael R. Thoseby, both of Cambridge, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 25, 1984, Ser. No. 654,342
Claims priority, application United Kingdom, Sep. 29, 1983, 8326118; Sep. 29, 1983, 8326119
Int. Cl.³ C08G *59/10, 59/28;* C07D *301/00, 303/36*
U.S. Cl. 528—90 20 Claims

1. A process for the preparation of aromatic N-glycidylamines which comprises

(i) heating an amine having at least one aromatic amino hydrogen atom with at least 0.7 equivalent, per amino hydrogen equivalent of the amine, of epichlorohydrin, in the presence of a di- or higher-valent metal salt of

(a) nitric or perchloric acid, or

(b) a carboxylic or sulfonic acid substituted by fluorine, chlorine or bromine on a carbon atom alpha to the carboxylic or sulfonic acid group, and

(ii) dehydrochlorinating the product from (i).

4,540,770

POLYSTYRYLPYRIDINE RESINS HAVING AN INCREASED TOUGHNESS, AND COMPOSITE MATERIALS COMPRISING THESE RESINS

Sammy Chevallier, Paris, France, assignor to Societe Nationale des Poudres et Explosifs, Paris and Office National d'Etudes et de Recherches Aerospatiales, Chatillon, both of, France

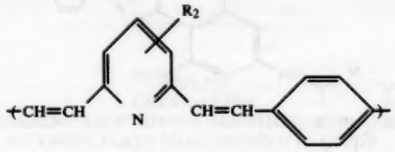
Filed Aug. 23, 1984, Ser. No. 643,651
Claims priority, application France, Sep. 12, 1983, 83 14487
Int. Cl.³ C08G *12/02*
U.S. Cl. 528—248 19 Claims

1. Resin containing a polymerisation product of at least one aromatic dialdehyde derivative with at least one pyridine derivative containing at least two reactive methylated substituents, wherein the said resin has the following general formula (I):

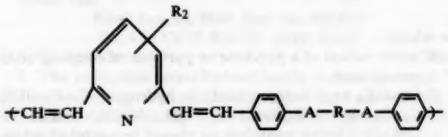
$$U_xV_yW_z$$

in which:

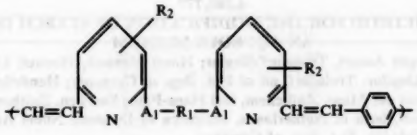
U denotes the grouping



V denotes the grouping



W denotes the grouping



in which:

R, R_1 are identical or different and are a chain segment consisting of (a) hydrocarbon radicals (b) hydrocarbon radicals containing hetero atoms,

A, A_1 are identical or different and denote an atom or group forming a bridge between the segment R and an aromatic nucleus of the styrylpyridine chain, comprising stereomobile bonds,

R_2 denotes hydrogen, or a methyl or ethyl radical,

x, y, z are integers or 0, the sum y+z being at least equal to 1.

4,540,771

HIGH SOLIDS POLYESTER POLYOLS AND RESINOUS POLYOLS THEREOF

Ronald R. Ambrose, Allison Park; Wen-Hsuan Chang; David T. McKeough, both of Gibsonia, and John R. Peffer, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1984, Ser. No. 656,562

Int. Cl.³ C08G *63/02*

U.S. Cl. 528—272 **18 Claims**

1. A polyester polyol having a number average molecular weight of up to about 1000 which is prepared by reacting a low molecular weight starting polyol with a polycarboxylic acid or a functional equivalent thereof, wherein the starting polyol is in an amount sufficient to produce a reaction product containing about 16 percent or higher of unreacted starting polyol.

4,540,772

CONTINUOUS PREPARATION OF NYLON FROM AQUEOUS SALT SOLUTION IN PRECONDENSATION ZONE HAVING BAFFLES

Gunter Pipper, Bad Durkheim; Franz Schmidt, Mannheim; Rainer Theysohn, Frankenthal; Siegfried Riegger, Ettenheim; Eduard Heil; Hermann Fischer, both of Limburgerhof; Richard Thoma, Battenberg, and Paul Matthies, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 15, 1984, Ser. No. 620,837

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321579

Int. Cl.³ C08G *69/28*

U.S. Cl. 528—335 **9 Claims**

1. A process for the continuous preparation of a nylon, which comprises

(a) passing an aqueous solution of a salt of a dicarboxylic acid of 6 to 18 carbon atoms and a diamine of 6 to 18 carbon atoms through a tubular precondensation zone possessing baffles,

(b) heating the aqueous solution in the first third of the precondensation zone to 250°–300° C. under superatmospheric pressure of from 1 to 10 bar, with the formation of a vapor phase containing steam and diamines and not less than 93% conversion of the salt to form a prepolymer,

(c) bringing the vapor phase into intimate contact with the prepolymer in the remaining two thirds of the precondensation zone,

(d) separating off the prepolymer from the vapor phase,

(e) transferring the prepolymer to a condensation zone, and

(f) condensing the prepolymer in the condensation zone under superatmospheric pressure of from 1 to 10 bar and at from 250° to 300° C.

4,540,773

METHOD OF PRODUCING AN IMPROVED POLYACETAL POLYMER

Hiroyasu Komazawa; Hiroshi Hotta; Hiroshi Nakatsuji, all of Fuji; Kiyoshi Yoko, Fujinomiya; Selichi Higashiyama, Fuji; Tuneyasu Nakashima, Kawasaki, and Noboru Gotoh, Fujinomiya, all of Japan, assignors to Polyplastics Company, Ltd., Osaka, Japan

Filed Sep. 11, 1984, Ser. No. 649,452

Int. Cl.³ C08G *2/28*

U.S. Cl. 528—480 **5 Claims**

1. A method of producing a polyacetal polymer, comprising contacting a crude polyacetal polymer obtained by polymerization or copolymerization and having as a principal component thereof connected oxymethylene radicals in a main chain with a non-soluble liquid medium at temperatures higher than 80° C. but lower than the melting point of the polymer and at heterogeneous equilibrium, by moving the crude polymer and the non-soluble medium in opposite directions relative to each other.

4,540,774

PROCESS FOR THE CONTINUOUS DEMONOMERIZATION AND POSTCONDENSATION OF POLYAMIDE 6 AND DEVICE FOR CARRYING OUT THIS PROCESS

Lüder Gerking, and Günter Panke, both of Berlin, Fed. Rep. of Germany, assignors to Karl Fischer Industrienlagen GmbH, Berlin, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 658,817

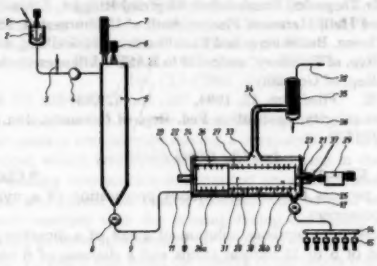
Claims priority, application European Pat. Off., Oct. 7, 1983, 83730095.3

Int. Cl.³ C08F *6/00*; C01F *7/00*

U.S. Cl. 528—502 **12 Claims**

1. A process for the continuous demonomerization and postpolymerization of polyamide 6 melts, comprising carrying out said demonomerization and postpolymerization in a reac-

tor partly filled with a polymer melt, said reactor comprising a cylinder having a horizontal axis, an interior rotor in the form of a cage arranged concentrically around said reactor axis and



rotatably movable around said axis, said cage having around its periphery a plurality of ring-shaped elements which partly dip into the melt.

4,540,775

1,4-DI-[2'-(2'',4''-DICHLORO-PHENYLAZO)ACETOACETAMIDO]-2,5-DIMETHYL-BENZENE

Bansi L. Kaul, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

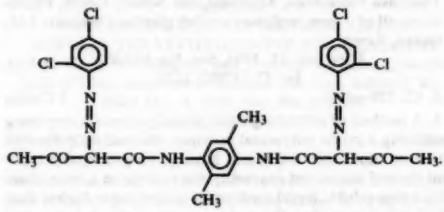
Continuation of Ser. No. 92,462, Nov. 8, 1979, abandoned. This application May 11, 1981, Ser. No. 262,790

Claims priority, application Switzerland, Nov. 14, 1978, 11691/78

Int. Cl.³ C09B *33/153, 35/035;* D06P *1/44, 1/50*

U.S. Cl. 534—575 **4 Claims**

1. The compound of the formula



4,540,776

REACTIVE FLUOROTRIAZINYLAMINONAPHTHOTRIAZOLY-PHENYLAZOPYRIDONE OR PYRIMIDONE DYESTUFFS

Hermann Henk, Cologne; Erich Krämer, Bergisch-Gladbach; Karl H. Schundehütte, and Horst Nickel, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

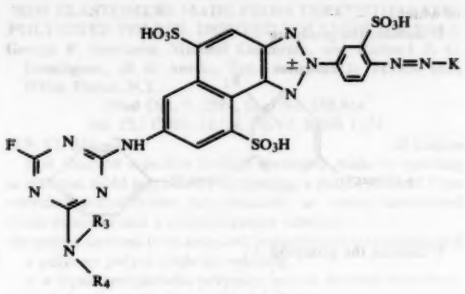
Continuation of Ser. No. 108,311, Dec. 31, 1979, abandoned. This application May 9, 1984, Ser. No. 608,587

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1979, 2901547

Int. Cl.³ C09B *62/085, 62/095, 62/08;* D06P *1/382*

U.S. Cl. 534—635 **2 Claims**

1. A metal free azo dyestuff of the formula



in which

K is the radical of a pyridone or pyrimidene coupling component, and

R_3 and R_4 each independently is hydrogen; C_1–C_6-alkyl; C_1–C_6-alkyl substituted by OH, SO_3H, COOH or OSO_3H; phenyl; naphthyl; or phenyl or naphthyl substituted by SO_3H or COOH.

4,540,777

METHOD FOR THE MODIFICATION OF STARCH IN AN AQUEOUS MEDIUM

Jürgen Amort, Troisdorf-Sieglar; Horst Hanisch, Hennef; Ute Klapdor, Troisdorf, all of Fed. Rep. of Germany; Hendrikus van der Maas, Zuilichem, and Hans-Peter Suerken, Zaltbommel, both of Netherlands, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Mar. 20, 1984, Ser. No. 591,404

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310088

Int. Cl.³ C08B *31/00;* C08L *3/00*

U.S. Cl. 536—102 **15 Claims**

1. A method for the modification of starch with organosilanes, comprising bringing the starch into intimate contact with an aqueous solution of an organofunctional alkoxysilane and/or an alkylalkoxysilane in the presence of alkali aluminate or alkali hydroxides.

4,540,778

SULFOSUCCINATE, ALKYL- AND ALKENYL SULFOSUCCINATE, SULFOMALEATE, AND DISULFOSUCCINATE HALF-ESTERS OF POLYGALACTOMANNANS

Martin M. Tessler, Edison; Teresa A. Dirscherl, North Plainfield, and Otto B. Wurzburg, Whitehouse Station, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

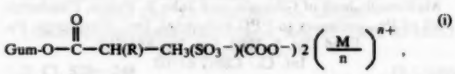
Filed Jun. 8, 1984, Ser. No. 618,854

The portion of the term of this patent subsequent to Jun. 7, 2000, has been disclaimed.

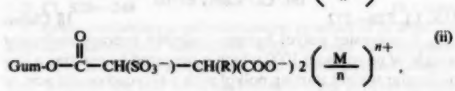
Int. Cl.³ C08B *37/00*

U.S. Cl. 536—114 **20 Claims**

1. A polygalactomannan gum derivative, comprising a gum sulfosuccinate half-ester of the general structure:



(i)



(ii)

or mixtures of (i) and (ii), wherein Gum-O- represents a gum molecule or a modified gum molecule; R is hydrogen or a

C_1–C_{22} straight or branched chain alkyl group or mixtures thereof, a C_3–C_{22} straight or branched chain alkenyl group or mixtures thereof, or a mixture of the alkyl and alkenyl groups; M is a cation; and n is the valence of M.

4,540,779

CRYSTALLINE 7-(R)-AMINO-3-(1'PYRIDINIUMMETHYL)-CEPH-3-EM-4-CARBOXYLATE MONOHYDROCHLORIDE MONOHYDRATE COMPOUND

Preston C. Conrad, Indianapolis, and Alvydas A. Jarmas, Speedway, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 20, 1983, Ser. No. 505,662
Int. Cl.³ C07D *501/38*; A61K *31/44*
U.S. Cl. 544—24 **1 Claim**

1. The crystalline monohydrochloride monohydrate of 7-(R)-amino-3-(1'-pyridiniummethyl)-ceph-3-em-4-carboxylate which has the following X-ray powder diffraction obtained with nickel-filtered copper radiation of $\lambda = 1.5418$ Å wherein d represents the interplanar spacing and I/I_1 the relative intensity:

d	I/I_1
10.75	.47
8.17	1.00
6.31	.20
5.74	.33
5.35	.20 b
4.95	.13
4.84	.07
4.47	.93
4.25	.53
4.08	1.00
3.81	.20
3.67	.07
3.52	.33
3.44	.13
3.29	.07
3.14	.53
3.01	.27
2.90	.10
2.80	.47
2.74	.27
2.63	.07
2.53	.20
2.47	.07
2.41	.03
2.38	.27
2.27	.27
2.20	.10
2.11	.03 b
2.06	.03 b
1.992	.17
1.948	.07
1.893	.10 b
1.837	.13.

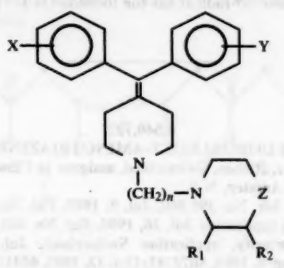
4,540,780

DIPHENYLMETHYLENE PIPERIDINES

David A. Downs, and Haile Tecle, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 2, 1983, Ser. No. 500,344
Int. Cl.³ C07D *413/06, 401/06, 417/06*
U.S. Cl. 544—129 **3 Claims**

1. Diphenylmethylene piperidine compounds having in the free base form the formula:



and pharmaceutically acceptable salts thereof, where X and Y, which can be the same or different, are H, halogen, halomethyl, alkyl, or alkoxy; n is 2, 3, or 4; Z is O, CH_2, S, single bond, =C-fluorophenoxy, =CHOH, $=CHCH_2CH_2OH$, $=C(OH)_2$, or NR_4, R_4 being H, alkyl, or aryl, and R_1 and R_2, which can be the same or different are hydrogen, alkyl, or an aromatic or hetero aromatic ring.

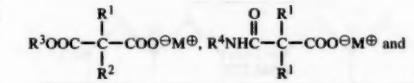
4,540,781

PRODUCT AND PROCESS TRIMERIZATION OF ORGANIC ISOCYANATES

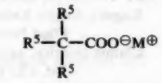
Edward A. Barsa, Cheshire, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 11, 1983, Ser. No. 522,127
Int. Cl.³ C07D *251/34*
U.S. Cl. 544—193 **13 Claims**

1. A method for the trimerization of an organic isocyanate comprising thermally activating at a temperature of from about 50° C. to about 200° C. in the presence of said isocyanate a catalyst otherwise having an induction period greater than one hour for initiating said trimerization at about 20° C. said catalyst consisting essentially of a compound selected from the group consisting of the following formulae

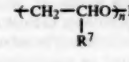


(I) (II)



(III)

wherein R^1 in (I) is alkyl having 2 to 8 carbon atoms, inclusive, and each R^1 in (II) is independently selected from alkyl having 2 to 8 carbon atoms, inclusive, R^2 is a highly branched alkyl having 3 to 8 carbon atoms, inclusive, R^3 is selected from the group consisting of hydrogen, alkyl, and aryl, R^4 is selected from the group consisting of alkyl, aryl, aralkyl, and cycloalkyl, each R^5 is independently selected from aryl, and $M^{\oplus}$ is a cation selected from the group consisting of alkali metal cations and quaternary ammonium cations having the formula $^{\oplus}N(R^6)_4$ wherein each of the four R^6 radicals is independently selected from the group consisting of alkyl, aralkyl, cycloalkyl, and radicals having the formula



(IV)

wherein R^7 is selected from the group consisting of hydrogen

and methyl and n is a number of from 1 to 4 provided that no more than one R^6 radical has the formula (IV).

4,540,782

FLUOROALKOXY-AMINOTRIAZINES

Willy Meyer, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

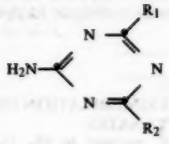
Division of Ser. No. 396,960, Jul. 9, 1982, Pat. No. 4,480,101. This application Jul. 26, 1984, Ser. No. 641,141

Claims priority, application Switzerland, Jul. 16, 1981, 4667/81; Aug. 6, 1981, 5075/81; Oct. 13, 1981, 6541/81; Jan. 11, 1982, 124/82; Apr. 8, 1982, 2205/82; Jun. 8, 1982, 3527/82

Int. Cl.³ C07D *251/52, 251/46, 251/42*

U.S. Cl. 544—194 **9 Claims**

1. A fluoroalkoxy-amine triazine of the formula I



(I)

wherein

R_1 is halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkyl, —NR_3R_4 or alkoxy alkyl having at most 4 carbon atoms, and

R_2 is a group —G—CF_2—T, where G is oxygen or sulfur, T is hydrogen, —CHClF, —CHBrF, —CHF_2 or —CHF—CF_3, R_3 is hydrogen, methyl or ethyl, and R_4 is hydrogen, methyl, ethyl, methoxy, ethoxy or methoxymethyl, with the proviso that R_1 is not C_1–C_4-alkyl when G is oxygen.

4,540,783

1',2'-DIACYL-(6R,S)-5,6,7,8-TETRAHYDRO-L-BIOPTERIN AND PROCESS FOR PREPARING THE SAME

Max Viscontini, Zurich, Switzerland, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

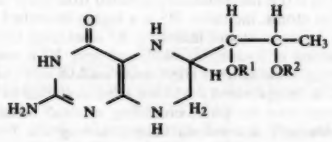
Filed Nov. 15, 1982, Ser. No. 441,736

Claims priority, application Japan, Nov. 13, 1981, 56-182948

Int. Cl.³ C07D *475/04;* **A61K** *31/495*

U.S. Cl. 544—258 **6 Claims**

1. A 1',2'-diacyl-6(R,S)-5,6,7,8-tetrahydro-L-biopterin of the formula (I):



(I)

wherein R1 and R2 are the same or different and each is an acyl group having 1 to 10 carbon atoms represented by R^5CO—in which R^5 is hydrogen; a linear or branched alkyl group having 1 to 9 carbon atoms; an alkyl substituted or unsubstituted phenyl group having 6 to 9 carbon atoms; a methyl, dimethyl or ethyl substituted or unsubstituted benzyl group; or a methyl substituted or unsubstituted phenyl ethyl group.

4,540,784

RECOVERY OF CAFFEINE ADSORBED TO ACTIVATED CARBON

Otto G. Vitzthum, Bremen; Peter Werkhoff, Stuhr, and Manfred Gehrig, Wolnzach, all of Fed. Rep. of Germany, assignors to Hag GF Aktiengesellschaft, Bremen, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 485,765

Int. Cl.³ C07D *473/12*

U.S. Cl. 544—274 **4 Claims**

1. A process for recovering caffeine from a caffeine loaded activitated carbon comprising the desorption of said caffeine loaded activated carbon with a formic acid solution comprising at least 78 weight percent formic acid.

4,540,785

SUBSTITUTED HYDROQUINONES

Norman A. Smith, Hornchurch, England, assignor to Ciba-Geigy AG, Basel, Switzerland

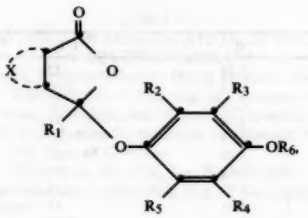
Filed Nov. 8, 1983, Ser. No. 549,938

Claims priority, application United Kingdom, Nov. 15, 1982, 8232603

Int. Cl.³ C07D *491/048, 307/88*

U.S. Cl. 546—116 **3 Claims**

1. A substituted hydroquinone of formula



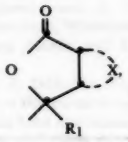
wherein

X represents the atoms to complete a benzo, naphtho, pyrido, pyrazo, imidazolo or pyrrolo radical,

R_1 is hydrogen, alkyl having 1 to 4 carbon atoms, phenyl or naphthyl, these radicals being unsubstituted or substituted by chlorine, bromine, iodine, —COOH, —COOR, —CONHR or —$CON(R)_2$ wherein R is alkyl having 1 to 4 carbon atoms,

R_2, R_3, R_4 and R_5 are each hydrogen or alkyl having 1 to 4 carbon atoms,

R_6 is hydrogen or a group of the formula



wherein R_1 and X have the meanings assigned to them above.

4,540,786

PREPARATION OF 2-CHLORO-3-CYANO-QUINOLINES

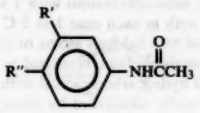
Terry L. Wright, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 22, 1983, Ser. No. 524,970

Int. Cl.³ C07D *215/16*

U.S. Cl. 546—162 **8 Claims**

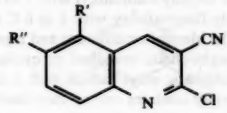
1. A method of introducing a nitrile group to a compound susceptible to Vilsmeier formylation corresponding to the formula



wherein R′ is —H, C_1–C_4 alkoxy, —Cl, —Br or C_1–C_4 alkyl and R″ is —H, C_1–C_4 alkoxy, —Cl, —Br, C_1–C_4 alkyl or —SCH_3, comprising the steps of:

(a) reacting the compound susceptible to Vilsmeier formylation in a liquid medium with a Vilsmeier reagent in the presence of excess phosphorus oxychloride;

(b) to the same reaction medium in the presence of phosphorus oxychloride introduce hydroxylamine or a protic acid salt thereof so as to introduce nitrile groups to a major portion of the compounds that reacted with the Vilsmeier reagent, so as to prepare a compound of the formula



4,540,787

METHOD OF PREPARING TRANS-D1-1-ALKYL-6-OXODECAHYDROQUINOLINES

John M. Schaus, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

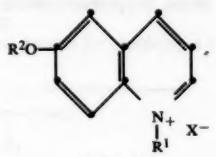
Continuation-in-part of Ser. No. 384,817, Jun. 3, 1982, abandoned. This application Aug. 10, 1983, Ser. No. 521,863

Int. Cl.³ C07D *215/20*

U.S. Cl. 546—164 **11 Claims**

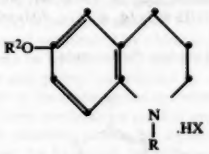
1. The synthetic method which comprises the steps of:

A. quaternizing a 6-alkyloxyquinoline with a C_{1-3} alkyl halide or pseudo halide or with an allyl halide or pseudo halide in an inert mutual solvent to yield a quaternary salt of the formula



wherein R^2 is C_{1-3} alkyl, R^1 is R^2 or allyl and X is a halogen or pseudo halogen;

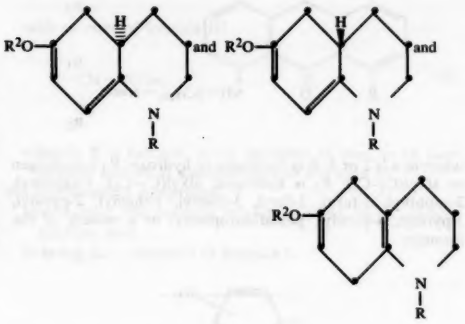
B. hydrogenating said quaternary salt in an inert mutual solvent under pressure using a noble metal catalyst to yield a tetrahydroquinoline salt of the formula



wherein R and R^2 are separately C_{1-3} alkyl and X has its previously assigned meaning;

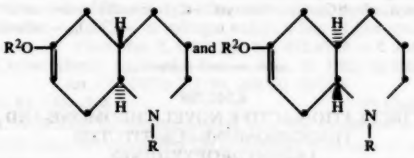
C. converting said HX salt to the corresponding free base with aqueous alkali;

D. reducing said free base with an alkali metal in liquid ammonia, optionally in the presence of a second mutual inert solvent, to yield a mixture of N-alkyl hexahydroquinolines of the formulas

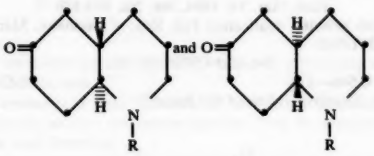


wherein R and R^2 have their previous meaning;

E. reducing said hexahydroquinoline mixture with a borohydride in glacial acetic acid and a mutual inert solvent to yield a racemic mixture of octahydroquinolines of the formula



F. treating said racemic mixture with acid in an inert mutual solvent to form a racemic mixture of 6-oxodecahydroquinolines of the formula



G. and then isolating said racemate, or an acid addition salt thereof, in substantially pure form.

4,540,788

SCHIFF BASES OF [(AMINOALKYL OR SUBSTITUTED AMINOALKYL)AMINO]-9,10-ANTHRACENEDIONES

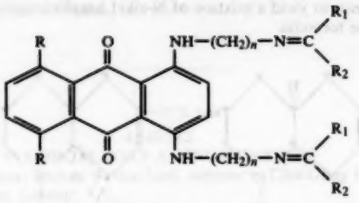
Keith C. Murdock, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 14, 1983, Ser. No. 513,577

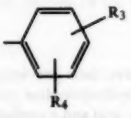
Int. Cl.³ C07D *401/10*

U.S. Cl. 546—264 **16 Claims**

1. A compound of the formula:



wherein n is 2 or 3; R is hydrogen or hydroxy; R_1 is hydrogen or alkyl(C_1–C_3); R_2 is hydrogen, alkyl(C_1–C_6), 1-naphthyl, 2-naphthyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, pentafluorophenyl or a moiety of the formula:



wherein R_3 and R_4 may be the same or different and are each hydrogen, hydroxy, fluoro, chloro, bromo, cyano, trifluoromethyl, alkyl(C_1–C_3), alkoxy(C_1–C_3), dimethylamino or benzyloxy; and R_1 and R_2 taken together is —$(CH_2)_m$— wherein m is 4, 5 or 6.

4,540,789

CIRCULATION-ACTIVE NOVEL CHROMONE-AND THIOCHROMONE-SUBSTITUTED 1,4-DIHYDROPYRIDINES

Siegfried Goldmann; Gerhard Franckowiak, both of Wuppertal; Matthias Schramm, Cologne; Günter Thomas, and Rainer Gross, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

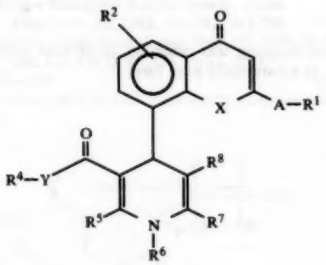
Filed Mar. 14, 1984, Ser. No. 589,436

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3311005

Int. Cl.[3] **C07D** *405/06*

U.S. Cl. 546—274 **12 Claims**

1. A dihydropyridine of the formula



in which

R^1 represents hydrogen, a straight-chain, cyclic or branched aliphatic hydrocarbon radical with 1 to 10 C atoms, a carboxylic acid alkyl ester with an alkyl radical of 1 to 10 C atoms, an aromatic or a heteroaromatic radical which is optionally substituted one to 5 identical or different substituents from the group comprising halogen, C_1–C_{10}-alkyl, C_1–C_{10}-alkoxy, C_1–C_{10}-alkylthio, C_1–C_{10}-alkylsulphinyl, cyano, hydroxyl, nitro, mono- or poly-fluoroalkyl with 1 to 5 C atoms, mono- or polyfluoroalkoxy with 1 to 5 C atoms, mono- or polyfluoroalkylthio with 1 to 5 C atoms, amino, monoalkylamino with 1 to 5 C atoms and dialkylamino with in each case 1 to 5 C atoms,

R^2 represents one to 3 halogen atoms or hydrogen,

R^4 represents a straight-chain, branched or cyclic, saturated or unsaturated hydrocarbon radical with 1 to 20 C atoms, which is optionally substituted by alkoxy with 1 to 10 C atoms, alkylthio with 1 to 10 C atoms, alkylsulphinyl with 1 to 10 C atoms, trialkylsilyl with in each case 1 to 6 C atoms, halogen, cyano, hydroxyl, amino, alkylamino with 1 to 6 C atoms, dialkylamino with in each case 1 to 6 C atoms, morpholinyl, piperidyl, piperazinyl, nitro, nitrate, aryl or heteroaryl, which can optionally be substituted by 1 to 3 identical or different substituents from the group comprising halogen, alkyl with 1 to 6 C atoms, alkoxy with 1 to 6 C atoms, alkylthio with 1 to 6 C atoms, alkylsulphinyl with 1 to 6 C atoms, alkylsulphonyl with 1 to 6 C atoms, hydroxyl, cyano, nitro, amino, alkylamino with 1 to 6 C atoms, dialkylamino with in each case 1 to 6 C atoms, mono- or poly-fluoroalkyl with 1 to 6 C atoms and mono- or poly-fluoroalkoxy with 1 to 6 C atoms,

R^5 and R^7 can be idential or different and represents hydrogen or a straight-chain, branched or cyclic, saturated or unsaturated aliphatic alkyl radical with 1 to 10 C atoms, which optionally contains one or two identical or different hetero chain members from the group comprising O, CO, NH, N-alkyl with 1 to 8 C atoms, S and SO_2, and is optionally substituted by halogen, nitro, cyano, azido, hydroxyl, aryl, heteroaryl, amino or monoalkylamino or dialkylamino with in each case 1 to 6 C atoms,

R^6 represents hydrogen or a straight-chain or branched alkyl radical with 1 to 20 C atoms, which is optionally substituted by alkoxy with 1 to 10 C atoms, halogen or morpholino,

R^8 represents hydrogen, nitro, cyano, halogen, alkyl with 1 to 4 C atoms, mono- or poly-fluoroalkyl with 1 to 4 C atoms or hydroxycarbonyl,

A represents a direct bond, an alkylene chain with 1 to 20 C atoms or an alkenylene chain with 2 to 20 atoms, the chains being optionally interrupted by O or S,

X represents O or S and

Y represents a direct bond, O, S, —NH— or —N— alkyl with 1 to 8 C atoms, or a pharmaceutically acceptable salt thereof.

4,540,790

CERTAIN 4-SUBSTITUTED-2,6-BIS(HETEROARYL)PYRIDINES

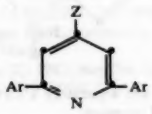
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 244,490, Mar. 16, 1981, Pat. No. 4,396,767. This application Apr. 25, 1983, Ser. No. 488,575

Int. Cl.[3] **C07D** *401/14, 403/14, 405/14, 409/14*

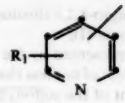
U.S. Cl. 546—283 **12 Claims**

1. A compound having the formula

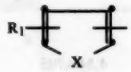


wherein:

Ar is a substituent having the formula



or,

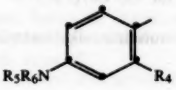


in which:

R_1 is hydrogen or non-tertiary lower-alkyl;

X is O or S;

Z is a substituent having the formula



in which:

R_4 is hydrogen, lower-alkyl, halo, lower-alkoxy, lower-alkoxycarbonyl or di-lower-alkylamino;

R_5 is lower-alkyl, and

R_6 is lower-alkyl, benzyl, cyano-lower-alkyl, or

NR_5R_6 is pyrrolidinyl, piperidinyl, morpholinyl or isoindolinyl.

4,540,791

PRODUCTION OF β-AMINO-α,β-UNSATURATED CARBOXYLIC ACID ESTERS

Luigi Cassar, Bologna, Italy; Abul Iqbal, Ettingen, and Alain C. Rochat, Fribourg, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

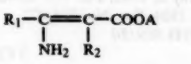
Filed Jul. 8, 1983, Ser. No. 512,058

Claims priority, application Switzerland, Aug. 7, 1982, 4170/82

Int. Cl.³ C07D *211/70*; C07C *101/02, 121/78*

U.S. Cl. 546—335 **10 Claims**

1. An improved process for producing a compound of the formula



(I)

wherein

A is alkyl of 1 to 12 carbon atoms, phenyl or phenyl substituted by chlorine, by alkyl of 1 to 6 carbon atoms or by alkoxy of 1 to 6 carbon atoms,

R_2 is hydrogen, alkyl of 1 to 12 carbon atoms, phenyl, phenyl substituted by chlorine, by alkyl of 1 to 6 carbon atoms or by alkoxy of 1 to 6 carbon atoms; cyano or the group —COOZ where Z is alkyl of 1 to 12 carbon atoms, phenyl or phenyl substituted by chlorine, by alkyl of 1 to 6 carbon atoms or by alkoxy of 1 to 6 carbon atoms, and

R_1 is phenyl or said phenyl substituted by one or two fluorine, chlorine or bromine atoms or mixtures thereof, by one, two or three methoxy or methyl groups or mixtures thereof with chlorine atoms, by cyano, by amino, by dimethylamino, by hydroxyl, by trifluoromethyl, by alkoxycarbonyl of 2 to 3 carbon atoms, by tert-butyl, by cyanophenyl, by acetyl or by alkylbenzoyloxy of 11–14 carbon atoms; biphenylyl; naphthyl or said naphthyl substituted by methoxy or by amino; anthryl; phenanthryl; pyrazolyl or said pyrazolyl substituted by amino; pyridyl or said pyridyl substituted by methyl, hydroxy or by amyloxy; indolyl; quinolyl; furyl or thienyl, by reacting equimolar amounts of a nitrile of formula II

(II)

with an ester of formula III

(III)

wherein X is halogen, in the presence of zinc, in an inert organic solvent at a temperature of less than 80° C.,

the improvement comprising

hydrolyzing, the reaction product formed, in an alkaline medium; and

isolating the compound of formula I.

4,540,792

PROCESS FOR THE PREPARATION OF A FREE L α-AMINO ACID

Auguste Commeyras, Clapiers; Aldo Previero, and Martine Pugniere, both of Montpellier, all of France, assignors to Centre National de la Recherche Scientifique and Institut National de la Sante et de la Reserche Medicale, both of Paris, France

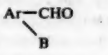
Filed Mar. 7, 1983, Ser. No. 472,479

Claims priority, application France, Mar. 23, 1982, 82 04886

Int. Cl.³ C07D *233/64, 209/20, 207/16*

U.S. Cl. 548—344 **24 Claims**

1. A process for the preparation of a free Lα-amino acid, which comprises racemizing the D antipode of an ester of said α-amino acid in the presence of a chemical catalyst formed by at least one aromatic aldehyde corresponding to the formula:



(I)

wherein:

Ar represents an aromatic ring optionally containing a heteroatom, and

B represents a basic function of the group consisting of tertiary amines and anions derived from the ionisation of an acid function,

to produce a mixture in dynamic equilibrium of the two forms D and L of said ester; hydrolysing the ester which is present in the L form enzymatically and irreversibly to produce the corresponding stereostable Lα-amino acid, said steps of chemical racemization and of enzymatic hydrolysis being carried out under identical reaction conditions; and recovering the free Lα-amino acid.

4,540,793

SUBSTITUTED PYRIDINES

Venkataraman Ramachandran, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 16, 1983, Ser. No. 532,700

Int. Cl.³ C07D *213/26*

U.S. Cl. 546—346 **5 Claims**

1. A process which comprises heating a sulfuric, hydrochloric, hydrobromic, hydrofluoric, hydroborofluoric, methanesulfonic, acetic, chloroacetic, or dichloroacetic salt of 4-(1,2-dichloroethyl)pyridine in an inert solvent selected from N,N-dimethylformamide, N,N-dimethylacetamide, and tetraethylurea to dehydrohalogenate it to a 4-chlorovinyl)pyridine.

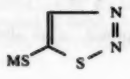
4,540,794

METHOD FOR PREPARING 5-MERCAPTO-1,2,3-THIADIAZOLE SALTS

Kunikazu Sakai; Daiei Tunemoto; Takeo Kobori, and Kiyosi Kondo, all of Kanagawa, Japan, assignors to Lederle (Japan), Ltd., Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 532,922
Claims priority, application Japan, Sep. 17, 1982, 57-160916
Int. Cl.³ C07D *285/06*
U.S. Cl. 548—127 **11 Claims**

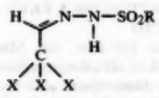
1. A method for preparing a 5-mercapto-1,2,3-thiadiazole salt represented by the general formula (I):



(I)

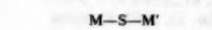
comprising the steps of:

providing a sulfonylhydrazone derivative represented by the general formula (II):



(II)

providing a sulfide represented by the general formula (III):



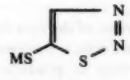
(III)

(wherein R is an aryl group, X is a chlorine or bromine atom, M is an alkali metal atom and M′ is a hydrogen atom or an alkali metal atom);

combining the sulfonylhydrazone derivative represented by the general formula (II) and the sulfide represented by the general formula (III) and allowing a reaction to occur; and

obtaining the 5-mercapto-1,2,3-thiadiazole salt represented by the general formula (I) wherein the sulfide represented by the general formula (III) is present in an amount of not less than 3 molar equivalents based on the amount of the sulfonylhydrazone derivative represented by the general formula (II).

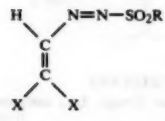
11. A method for preparing a 5-mercapto-1,2,3-thiadiazole salt represented by the general formula (I):



(I)

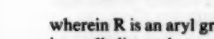
comprising the steps of:

providing a sulfonylhydrazone derivative represented by the general formula (IV):



(IV)

providing a sulfide represented by the general formula (III):



(III)

wherein R is an aryl group, X is a chlorine or bromine atom, M is an alkali metal atom and M′ is a hydrogen atom or an alkali metal atom);

combining the sulfonylhydrazone derivative represented by the general formula (IV) and the sulfide represented by the general formula (III) and allowing a reaction to occur; and

obtaining the 5-mercapto-1,2,3-thiadiazole salt represented by the general formula (I);

wherein the sulfide represented by the general formula (III) is present in an amount of not less than 3 molar equivalents based on the amount of the sulfonylhydrazone derivative represented by the general formula (IV).

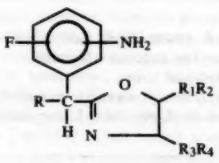
4,540,795

FLUORONITROARALKYLOXAZOLINES, DERIVATIVES THEREOF, AND NUCLEOPHILIC SUBSTITUTION PROCESSES FOR PREPARING THEM

Kenneth C. Lilje, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 25, 1983, Ser. No. 469,726
Int. Cl.³ C07D *263/10*
U.S. Cl. 548—239 **3 Claims**

1. A 2-(aminofluorobenzenealkyl)oxazoline corresponding to the formula:



wherein R is halo or an alkyl group having not more than 10 carbons, and R_1, R_2, R_3, and R_4 are independently selected from hydrogen, methyl, and ethyl.

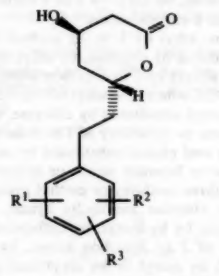
4,540,796

PROCESS FOR PREPARING INHIBITORS OF 3-HYDROXY-3-METHYLGLUTARYL COENZYME A REDUCTASE VIA A CHIRAL SYNTHON

John D. Prugh, Chalfont, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 373,605, May 3, 1982, Pat. No. 4,440,927. This application Jan. 6, 1984, Ser. No. 568,977
Int. Cl.³ C07D *309/30*
U.S. Cl. 549—292 **3 Claims**

1. A process for preparing the compound of structural formula:

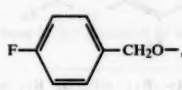


I

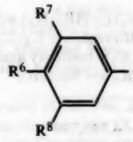
wherein:

R^2 and R^3 are independently chloro or C_{1-3}alkyl; and

R^1 is



(1)



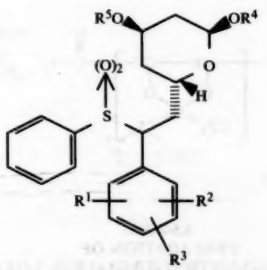
(2)

wherein

R^6 is hydrogen, fluoro- or chloro, and R^7 and R^8 are independently hydrogen, chloro or C_{1-3}alkyl;

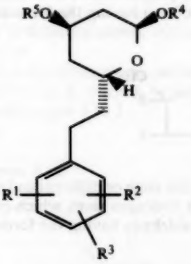
which comprises the steps of:

(A) treating a compound of structural formula:



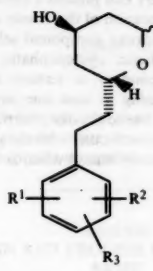
VII

wherein R^4 is C_{1-3}alkyl; R^5 is benzyl, or 4-methoxybenzyl; with sodium amalgam at 20° to 40° C. for 0.25 to 6 hours to produce the compound of formula:



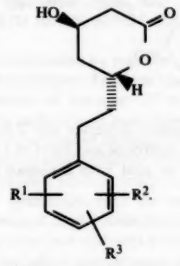
VIII

(B) followed by treatment with hydrogen in the presence of a hydrogenation catalyst to remove the R^5 group followed by treatment with aqueous acetic acid to produce the compound of structure X



X

(C) followed by treatment with an oxidizing agent to produce the compound of formula



4,540,797

PROCESS FOR RESOLUTION OF CHIRAL ALCOHOLS OR PHENOLS OR CHIRAL LACTONIC COMPOUNDS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and André Teche, Nanterre, all of France, assignors to Roussel Uclaf, Paris, France

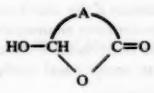
Continuation of Ser. No. 253,869, Oct. 18, 1982, abandoned, which is a division of Ser. No. 21,833, Mar. 19, 1979, Pat. No. 4,265,817. This application Dec. 6, 1982, Ser. No. 447,442

Claims priority, application France, Mar. 17, 1978, 78 07778

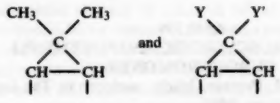
Int. Cl.³ C07D *307/77*

U.S. Cl. 549—302 **12 Claims**

1. A process of resolving chiral alcohols or phenols of the formula ZOH or chiral lactonic compounds of the formula

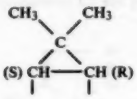


wherein A is selected from the group consisting of bicyclic hydrocarbon chain of 5 to 10 carbon atoms optionally containing one unsaturation, radicals

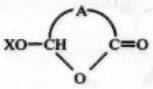


wherein Y and Y' are individually selected from the group consisting of hydrogen, fluorine, bromine, chlorine and alkyl of 2 to 6 carbon atoms or taken together with the carbon atoms to which they are attached form a carbon homocycle of 3 to 7

carbon atoms, the chain A can contain one or more chiral atoms or the lactone moiety can present a chirality due to the dissymetric spatial configuration of the whole of the molecule and Z is derived from hydroxy compound selected from the group consisting of aliphatic, cycloaliphatic, aromatic and heterocyclic primary, secondary or tertiary alcohols and a substituted phenol containing at least one asymetric carbon atom or having a chirality due to the dissymetric spatial configuration of the whole of the molecule, with the proviso Z is not (R) or (S) α-cyano-3-phenoxy-benzyl when A is



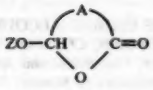
comprising reacting a lactonic compound of the formula



wherein A has the above definition and X is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms in the presence of an acid with a phenol or alcohol of the formula

Z—OH

wherein Z has the above definition to obtain either a mixture of diastereoisomers of the formula I



named I_B when the lactone is a well defined optical isomer and the chiral centers of the alcohol or phenol do not have an unequivocal configuration or a mixture of diastereoisomers of formula I named I_C when the alcohol or phenol is a well defined optical isomer and the chiral atoms of the lactone does not have an unequivocal configuration and then separating by physical methods the diastereoisomeric ethers contained either in the mixture of type I_B or in the mixtures type I_C, submitting to acid hydrolyiss the diastereoisomeric ethers thus separated to obtain the resolved alcohols or phenols if the chiral centers of the starting alcohol or phenol does not have an unequivocal configuration or the resolved lactonic compounds if the chiral atoms of the lactone does not have an unequivocal configuration.

4,540,798

ANTIATHEROSCLEROTIC AMINOETHENYL FUROCHROMONES

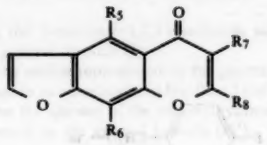
Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 378,700, May 17, 1982, Pat. No. 4,438,274. This application Oct. 27, 1983, Ser. No. 546,003

Int. Cl.³ C07D *311/78*

U.S. Cl. 549—387 **2 Claims**

1. A furochromone of formula II



II

wherein R_7 is $—CH_2—R_{11}$, wherein R_{11} is hydrogen or C_1–C_5 thioalkyl;

wherein R_8 is $—CH=CH—NR_{12}R_{13}$ wherein R_{12} and R_{13}, being the same or different, are C_1–C_3 alkyl; and

wherein one of R_5 and R_6 is methoxy and the other is hydrogen or both R_5 and R_6 are methoxy.

4,540,799

OLIGOMERS OF PREFLUORO(2,2-DIMETHYL-1,3-DIOXOLE) AND THEIR FLUORINATION PRODUCTS

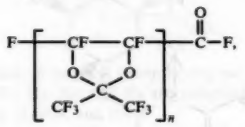
Edward N. Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 421,825, Sep. 23, 1982, Pat. No. 4,496,749, which is a division of Ser. No. 279,867, Jul. 2, 1981, Pat. No. 4,409,393. This application Jun. 11, 1984, Ser. No. 619,489

Int. Cl.³ C07D *317/00*

U.S. Cl. 549—448 **3 Claims**

1. An oligomer of perfluro(2,2-di-methyl-1,3-dioxole), which has the following formula:



where n is 2 to 8.

4,540,800

PREPARATION OF 2,3-DIHYDRO-2-METHYL-2,3-DIALKYL-7-OXYBENZOFURANS

Yukio Inaba; Taisei Igarashi; Susumu Tahara, and Takashi Miyatake, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

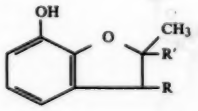
Filed Apr. 12, 1983, Ser. No. 484,237

Claims priority, application Japan, Apr. 22, 1982, 57-66286; Apr. 22, 1982, 57-66287

Int. Cl.³ C07D *307/86*

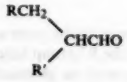
U.S. Cl. 549—462 **18 Claims**

1. A process for the preparation of a 2,3-dihydro-2-methyl-2,3-dialkyl-7-oxybenzofuran having the formula (I):



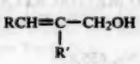
(I)

wherein R and R' are the same or different and each represents a lower alkyl group or hydrogen atom, which comprises reacting catechol with an aldehyde having the formula (II)



(II)

or an alcohol having the formula (III):



(III)

in a gaseous phase in the presence of a solid acid catalyst.

4,540,801

5 FLUORO PGI COMPOUNDS

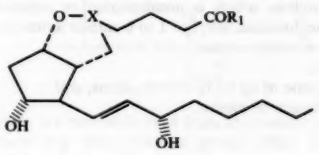
Leonard N. Nysted, Highland Park, Ill., and Raphael Pappo, Redwood City, Calif., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 250,530, Apr. 2, 1981, abandoned. This application Jul. 13, 1983, Ser. No. 513,469

Int. Cl.³ C07D *307/935*

U.S. Cl. 549—465 **5 Claims**

1. A compound of formula I



I

wherein R_1 is:

(a) OR_2;

(b) NR_3R_4

(c)

or

(d)

wherein R_2 is:

(a) Na, K, or ½ Ca;

(b) hydroxyalkyl of 1 to 6 C atoms;

(c) hydrogen; or

(d) alkyl of 1 to 6 carbon atoms wherein R_3 is:

(a) hydrogen; or

(b) alkyl of 1 to 6 carbon atoms, inclusive; wherein R_4 is:

(a) hydrogen; or

(b) alkyl of 1 to 6 carbon atoms, inclusive; wherein n is an integer from 4 to 5; wherein m and q are integers and taken together equal 4 to 5

wherein Y is:

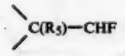
(a) O

(b) NH wherein X is:

(a)

or

(b)



wherein R_5 is alkoxy from 1 to 6 carbon atoms and the individual isomers either alone or in combination; and the pharmacologically acceptable salts thereof.

4,540,802

EPOXY RESIN AND PROCESS FOR PREPARING THE SAME

Haruo Tomita, and Kazuya Yonezawa, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

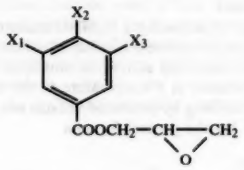
Filed May 3, 1983, Ser. No. 491,226

Claims priority, application Japan, May 31, 1982, 57-93446

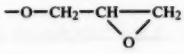
Int. Cl.³ C07D *303/26, 303/27, 303/16, 301/30*

U.S. Cl. 549—557 **4 Claims**

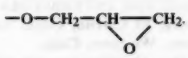
1. An epoxy resin produced by reaction of gallic acid and an epihalohydrin in the presence of a phase transfer catalyst and in the substantial absence of water at 50° to 110° C., with the epihalohydrin being present in at least an equimolar amount to the molar amount of the total of carboxyl and hydroxyl groups of gallic acid and dehydrohalogenation of the resulting halohydrin ether and halohydrin ester moieties in an aqueous solution of an alkali metal hydroxide, with the amount of the alkali metal hydroxide being at least 1 times the molar amount of the total of hydroxyl groups and carboxyl group of the gallic acid, in the presence of said phase transfer catalyst at 20° to 30° C. to give a product mixture containing polyglycidyl compounds having the general formula:



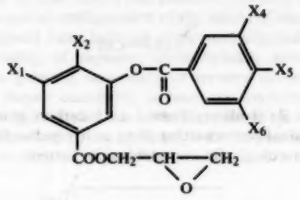
wherein X_1, X_2 and X_3 are —OH or



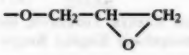
provided that at least one of X_1 to X_3 is



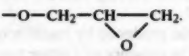
3. An epoxy resin produced by reaction of tannic acid and an epihalohydrin in the presence of a phase transfer catalyst and in the substantial absence of water at 50° to 110° C., with the epihalohydrin being present in at least an equimolar amount to the molar amount of the total of carboxyl and hydroxyl groups of tannic acid and dehydrohalogenation of the resulting halohydrin ether and halohydrin ester moieties in an aqueous solution of an alkali metal hydroxide, with the amount of the alkali metal hydroxide being at least 1 times the molar amount of the total of hydroxyl groups and carboxyl groups of the tannic acid, in the presence of said phase transfer catalyst of 20° to 30° C. to give a product mixture containing polyglycidyl compounds having the general formula:



wherein X_1, X_2, X_4, X_5 and X_6 are —OH or



provided that at least one of X_1, X_2, X_4, X_5 and X_6 is



4,540,803

HYDROSILAZANE POLYMERS FROM $[R_3SI]_2NH$ AND $HSICL_3$

John P. Cannady, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 28, 1983, Ser. No. 555,755
Int. Cl.³ C07F *7/10*
U.S. Cl. 556—412 **36 Claims**

1. A process of preparing a R_3SiNH-containing hydrosilazane polymer, which process consists of contacting and reacting, in an inert, essentially anhydrous atmosphere, trichlorosilane with a disilazane at a temperature in the range of 25° to 300° C. while distilling by-produced volatile products, wherein said disilazane has the general formula

$(R_3Si)_2NH$

where R is selected from the group consisting of vinyl, hydrogen, phenyl, and alkyl radicals containing 1 to 3 carbon atoms.

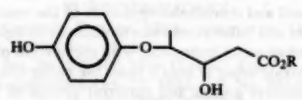
4,540,804

HERBICIDE INTERMEDIATES

Peter K. Wehrenberg, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 12, 1984, Ser. No. 660,171
Int. Cl.³ C07C *69/76*
U.S. Cl. 560—060 **9 Claims**

1. An alkyl 3-hydroxy-4-(4-hydroxyphenoxy)pentanoate having the formula



wherein R is an optionally substituted alkyl group ranging from about 1 to about 18 carbon atoms.

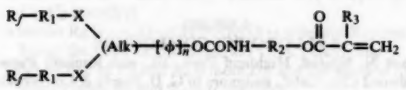
4,540,805

DI-PERFLUOROALKYL CARBAMYL GROUP CONTAINING ACRYLATES AND METHACRYLATES

Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 1, 1984, Ser. No. 655,833
Int. Cl.³ C07C *125/065, 125/067*
U.S. Cl. 560—135 **16 Claims**

1. A monomer of the formula



(I)

where

R_f is perfluoroalkyl, omega-hydroperfluoroalkyl, or perfluoroalkoxy substituted perfluoroalkyl;

R_1 is alkylene of up to 12 carbon atoms;

X is —S— or $—SO_2—$;

Alk is alkanetriyl having from 1 to 12 carbon atoms;

ϕ is phenylene which is unsubstituted or substituted by chlorine, bromine, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms;

n is 0 or 1;

R_2 is alkylene of up to 12 carbon atoms; and

R_3 is hydrogen or methyl.

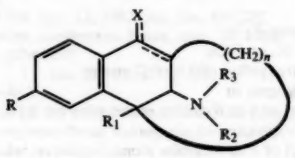
4,540,806

BENZOCYCLOALKANE AMINES

Meier E. Freed, Paoli, Pa., and Magid A. Abou-Gharbia, Wilmington, Del., assignors to American Home Products' Corporation, New York, N.Y.

Filed Dec. 22, 1983, Ser. No. 564,588
Int. Cl.³ C07C *87/02, 101/72, 103/127*; A61K *31/22*
U.S. Cl. 560—139 **9 Claims**

1. A compound of the formula



in which

R is alkoxy of 1 to 6 carbon atoms, hydroxy, alkanoyloxy of 2 to 6 carbon atoms, aralkoxy of 7 to 12 carbon atoms;

R_1 is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, or phenylalkyl of 7 to 12 carbon atoms;

R_2 is hydrogen, alkyl of 1 to 6 carbon atoms or phenylalkyl of 7 to 12 carbon atoms;

R_3 is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, hydroxy, phenylalkyl of 7 to 12 carbon atoms or alkanoyl of 2 to 6 carbon atoms;

X is hydrogen, oxygen or hydroxy;

n is one of the integers 2, 3, 4, 5 or 6;

the dotted lines represent unsaturation between the cycloalkyl ring and X when X is oxygen and within the cycloalkyl ring when X is hydrogen;

or a pharmaceutically acceptable salt thereof.

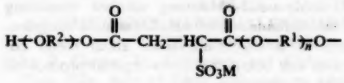
4,540,807

AROMATIC BASE POLY-SULFOSUCCINATE ESTERS

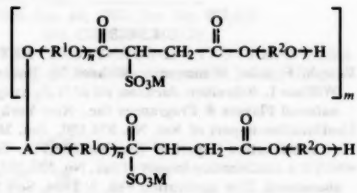
Kermit D. Longley, Park Forest, and Anastasios Karalis, Chicago, both of Ill., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,340
Int. Cl.[3] C07C 143/12
U.S. Cl. 560—151 12 Claims

1. Aromatic base poly-sulfosuccinates corresponding to the following formula

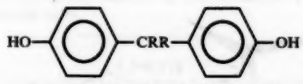


(I)



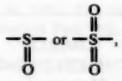
wherein A is a radical derived from an aromatic polyhydroxy compound free from reactive groups other than hydroxy groups selected from the group of:

(a) bisphenols of the formula

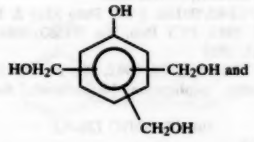


wherein R is C_1–C_3 alkyl,

(b) Bisphenol A derivatives wherein the $—C(CH_3)_2—$ moiety in Bisphenol A is replaced by —S—,

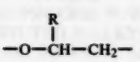


(c) trimethylolphenols of the formula



(d)

wherein R is C_1–C_3 alkyl; R^1 is an alkylene moiety of an oxypropylene radical or a mixture of oxypropylene radicals and oxyethylene radicals in which any oxyethylene radicals present constitute up to about 25% by weight of the oxypropylene radicals, R^2 is an alkylene moiety of an oxyalkylene radical



where R is an alkyl radical containing from 1 to 16 carbon atoms; n is an integer from 1 to 2; m is an integer from zero to 2 with the proviso that, when m is zero, the dangling valence is absent; and M is a cation selected from the group of alkali metals, ammonium, alkaline earth metals and water-soluble organic amines.

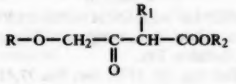
4,540,808

PROCESS FOR THE PREPARATION OF 4-ALKOXYACETOACETIC ACID ESTER

Erich Greth, Visp, Switzerland, assignor to Lonza, Ltd., Gampel, Switzerland

Filed Sep. 27, 1982, Ser. No. 423,568
Claims priority, application Switzerland, Oct. 1, 1982, 6321/81
Int. Cl.[3] C072 69/72
U.S. Cl. 560—178 11 Claims

1. Process for the production of a 4-alkoxyacetoacetic acid ester from a 4-chloroacetoacetic ester or 4-bromoacetoacetic ester consisting of reacting a 4-chloroacetoacetic ester or 4-bromoacetoacetic ester with a highly concentrated solution of alkali alcoholate in an aliphatic alcohol having been concentrated at a temperature of 50° to 120° C., at least 2.8 mole of alkali alcoholate being present per mole of 4-chloroacetoacetic ester or 4-bromoacetoacetic ester, at least 7 moles of the alcohol being present per mole of the 4-chloroacetoacetic ester or 4-bromoacetoacetic ester, and 10 to about 40 weight percent of the alkali alcoholate being present based on the starting solution of the reactants, whereby the 4-alkoxyacetoacetic acid ester results, the 4-alkoxyacetoacetic acid ester has the formula:



wherein R and R_2 are each alkyl, and R_1 is H, alkyl or substituted alkyl.

4,540,809

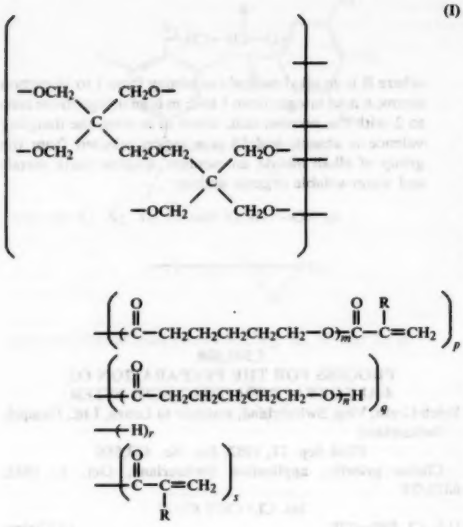
(METH) ACRYLATE ESTERS OF DIPENTAERYTHRITOL CAPROLACTONE CONDENSATES

Minoru Yokoshima, Yamaguchi; Kazuyoshi Nawata, Onoda; Tetsuo Ohkubo, Ube, and Hideaki Hattori, Yamaguchi, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,537
Claims priority, application Japan, Jun. 25, 1982, 57-108528
Int. Cl.[3] C07C 69/675, 69/73
U.S. Cl. 560—185 6 Claims

1. An ethylenically unsaturated compound of the formula

(I)



wherein:

R is hydrogen or methyl;

on the average m and n respectively are 1 to 5;

on average p is 1 to 6;

on the average q and r are **O** to 3;

on the average s is 0 to 5;

p+q+r+s is 6;

q+r is 0 to 3;

p+s is 3 to 6; and

the average value of mp +nq is 1 to 30.

4,540,810

MANUFACTURE OF ALKANOL AND GLYCOL ESTERS

John F. Knifton, Austin, Tex., assignor to Texaco Development Corporation, Bellairo, Tex.

Filed Sep. 20, 1979, Ser. No. 77,419

The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.

Int. Cl.³ C07C *67/36, 69/003*

U.S. Cl. 560—226 **20 Claims**

1. In a process for the concurrent synthesis of alkanol and vicinal glycol esters from mixtures of carbon monoxide and hydrogen which comprises the following steps:

(a) contacting said mixtures of carbon monoxide and hydrogen with a liquid medium containing one or more aliphatic carboxylic acids and a ruthenium-containing catalyst and a co-catalyst species,

(b) heating said reaction mixture to a temperature of between about 100° C. and 350° C., at superatmospheric pressures of 500 psi or greater with sufficient carbon monoxide and hydrogen to satisfy the stoichiometry of the desired ester syntheses, until substantial formation of the desired esters of the alkanols and vicinal glycols has been achieved,

(c) isolating said esters contained therein;

(d) the improvement which comprises utilizing as said co-catalyst species a quaternary aryl or alkaryl phosphonium salt whereby the selectivity to the vicinal glycol esters relative to the alkanol esters is increased.

4,540,811

PREPARATION OF CARBOXYLIC ACID ESTERS

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,531

Int. Cl.³ C07C *67/38*

U.S. Cl. 560—233 **4 Claims**

1. A process for the preparation of a carboxylic acid ester by carbonylation which comprises reacting under superatmospheric pressure an olefin in the absence of oxygen with carbon monoxide in the presence of an alcohol, in the presence of a non-Group VIII-noble-metal-containing catalyst consisting essentially of a molybdenum-nickel-alkali metal, a tungsten-nickel-alkali metal or a chromium-nickel alkali metal co-catalyst component, and being free from organic promoters, and in the presence of a halide.

4,540,812

2-ACETOXY-4-(2-BORNYLOXY) BUTANE

Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

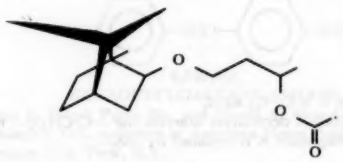
Continuation-in-part of Ser. No. 574,150, Jan. 26, 1984, which is a continuation-in-part of Ser. No. 533,915, Sep. 19, 1983, which is a continuation-in-part of Ser. No. 507,292, Aug. 1, 1983, abandoned. This application Feb. 9, 1984, Ser. No. 578,346

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.³ C07C *69/14*

U.S. Cl. 560—256 **1 Claim**

1. The 2-acetoxy-4-(2-bornyloxy)butane having the structure:



4,540,813

PROCESS FOR THE PREPARATION OF UREA

Petrus J. M. van Nassau, Munstergeleen; Andreas J. Biermans, Urmond; Kees Jonckers, Born, and Mario G. R. T. de Cooker, Beek, all of Netherlands, assignors to Unie van Kunstmestfabrieken B.V., Utrecht, Netherlands

PCT No. PCT/EP82/00188, § 371 Date May 2, 1983, § 102(e) Date May 2, 1983, PCT Pub. No. WO83/00862, PCT Pub. Date Mar. 17, 1983

PCT Filed Aug. 31, 1982, Ser. No. 496,317

Claims priority, application Netherlands, Sep. 1, 1981, 8104040

Int. Cl.³ C07C *126/02*

U.S. Cl. 564—71 **14 Claims**

1. Process for the preparation of urea from ammonia and carbon dioxide at an elevated temperature and pressure having a reaction zone and a stripping zone wherein

in said reaction zone, carbon dioxide and a portion of said ammonia are converted to ammonium carbamate, and a portion of said ammonium carbamate is converted to urea to form a reaction zone effluent containing product urea, unconverted ammonium carbamate, and excess ammonia, said conversions resulting in a net formation of heat, and

in said stripping zone, a urea product stream containing unconverted ammonium carbamate is heated to decompose at least a portion of said

ammonium carbamate by heat exchange with said reaction zone, and stripped with carbon dioxide to remove gaseous

ammonia and carbon dioxide thus formed from said urea product stream,

characterized in that said reaction zone is maintained at a pressure of at least 20 bar higher than the pressure in said stripping zone and the conversion of ammonium carbamate to urea in said reaction zone is continued until the quantity of urea formed is at least 50 percent of that quantity of urea that would be obtained at equilibrium under the reaction conditions present in said reaction zone.

4,540,814

1,4-DIMETHOXY NAPHTHALENECARBOXAMIDE ANTICONVULSANTS

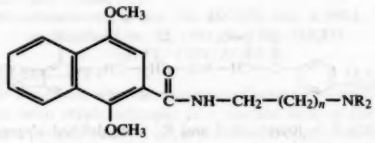
John P. Carter, Jr., Columbus, and Richard L. Wolgemuth, Plain City, both of Ohio, assignors to Adria Laboratories, Inc., Columbus, Ohio

Filed Jun. 24, 1983, Ser. No. 507,620

Int. Cl.³ C07C *103/26*

U.S. Cl. 564—172 **5 Claims**

1. 1,4-Dimethoxy naphthalenecarboxamide having the general formula



wherein R is selected from the group consisting of methyl, ethyl and propyl groups and n is a whole number from 1 to 2 and its nontoxic salts.

4,540,815

PROCESS FOR THE PREPARATION OF PURE 3-ACETYLAMINO-ANILINES

Theodor Papenfuhs, Frankfurt am Main, and Manfred Hintzmann, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

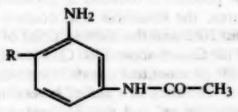
Filed Nov. 16, 1984, Ser. No. 672,400

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341883

Int. Cl.³ C07C *102/00, 102/04*

U.S. Cl. 564—216 **7 Claims**

1. A process for the preparation of a pure 3-acetylamino-aniline of the formula (1)



(1)

in which R denotes a hydrogen atom or an alkoxy group with 1–4 carbon atoms, by reduction of 1,3-dinitrobenzene in an alkanol with 1–4 carbon atoms to 1,3-diaminobenzene or by reaction of 2,4-dinitrochlorobenzene with sodium hydroxide in an alkanol with 1–4 carbon atoms and subsequent reduction to the 2,4-diaminoalkoxybenzene, and in each case subsequent monoacetylation in the alkanol mentioned to give the 1-amino-3-acetylamino-benzene or the 2-amino-4-acetylamino-alkoxybenzene and isolation of the compound of the above formula (1) obtained in the alkanolic solution, which optionally contains water, which comprises carrying out the isolation by precipitation of the compound of the above formula (1), in the form of the hydrohalide, from the alkanolic solution by means of hydrogen halide or aqueous hydrogen halide acid and subsequent filtration.

4,540,816

SINGLE-VESSEL PROCESS FOR PREPARING RING-SUBSTITUTED N-ALKYLANILINES

Karl Sommer, Königstein, and Rudolf Schickfluss, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

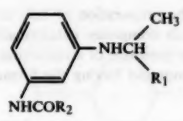
Filed May 10, 1984, Ser. No. 608,979

Claims priority, application United Kingdom, May 13, 1984, 3317470

Int. Cl.³ C07C *102/04, 102/06, 102/02, 102/00*

U.S. Cl. 564—218 **5 Claims**

1. A process for preparing ring-substituted N-alkylanilines of the formula (1)

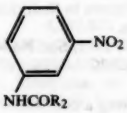


(1)

in which R_1 and R_2 each denote methyl or ethyl, in a single vessel, which comprises acylating m-nitroaniline in an excess of an aliphatic carbonyl compound of the formula (2)

(2)

in which R_1 is as defined above, with an acylating agent which contains the —CO—R_2 acyl radical—which is transferred—and reductively alkylating the resulting compound of the formula (3)



(3)

in which R_2 is as defined above, at temperatures of 120°–160° C. under a hydrogen pressure of 20–150 bar without intermediate isolation through the presence of an acid reaction promoter and of a nickel catalyst.

4,540,817

PROCESS FOR THE PREPARATION OF 5-AMINO-2,4-DIMETHYLACETANILIDE

Horst Behre; Heinz U. Blank, both of Odenthal; Alfred Seyberlich, and Ferdinand Hagedorn, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 326,648, Dec. 2, 1981, abandoned. This application Jul. 25, 1983, Ser. No. 516,438

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3047946

Int. Cl.³ C07C *102/00*

U.S. Cl. 564—218 **15 Claims**

1. A process for the preparation of 5-amino-2,4-dimethylacetanilide which comprises contacting 5-nitro-2,4-dimethylacetanilide in the form of a mixture containing 70 to 94.9% by weight of 5-nitro-2,4-dimethylacetanilide, 5 to 20% by weight of 3-nitro-2,4-dimethylacetanilide and 0.1 to 10% by weight of 6-nitro-2,4-dimethylacetanilide, relative to the sum of said compounds with hydrogen in the presence of a hydrogenation catalyst under hydrogenation conditions in a mixture of water and an alkanol wherein these solvents are present in a 100:1 to 1:100 weight ratio, separating off the hydrogenation

catalysts and separating 5-amino-2,4-dimethylacetanilide from a mixture of alkanol and water by means of crystallization.

4,540,818

PROCESS FOR PREPARATION OF 3,3'- OR 3,4'-DIAMINODIPHENYLMETHANE

Keizaburo Yamaguchi, Kanagawa; Kenichi Sugimoto, Tokyo; Yoshimitsu Tanabe, Kanagawa; Saburo Kawashima, and Akihiro Yamaguchi, both of Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

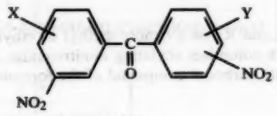
Filed May 2, 1983, Ser. No. 490,730

Claims priority, application Japan, Mar. 23, 1983, 58-47097

Int. Cl.³ C07C *87/50*

U.S. Cl. 564—330 **9 Claims**

1. A process for the preparation of 3,3'- or 3,4'-diaminodiphenylmethane, which comprises catalytically reducing and dechlorinating, in the presence of a reduction catalyst, a dinitrobenzophenone compound having the formula



wherein X is chlorine and attached to a position 4 or 6 on the benzene ring, and Y is hydrogen or chlorine with the proviso that when Y is hydrogen, the nitro group is attached to a position 3' or 4', and when Y is chlorine, Y is attached to a position 4' and the nitro group is attached to a position 3'.

4,540,819

PROCESS FOR PREPARING SECONDARY AMINES

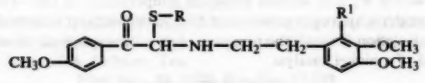
Kathleen L. Wert, Philadelphia, and Alan W. Tremper, Lansdowne, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Apr. 28, 1983, Ser. No. 489,654

Int. Cl.³ C07C *149/24, 149/42*

U.S. Cl. 564—340 **8 Claims**

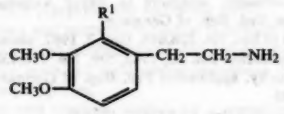
1. A process for preparing a compound of the formula:



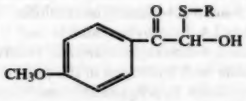
in which:

R is lower alkyl of 1-4 carbons, and

R^1 is chloro or fluoro, comprising the step of reacting a compound of the formula:

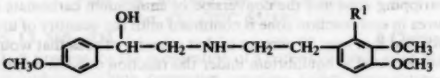


in which R^1 is as defined above, with a compound of the formula:

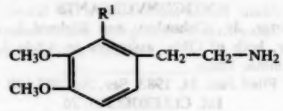


in which R is as defined above, in an organic solvent which is chemically inert to the reactants and in which the reactants are substantially soluble.

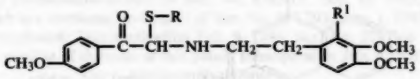
5. A process for preparing a compound of the formula:



in which R^1 is chloro or fluoro, comprising the steps of reacting a compound of the formula:



in which R^1 is as defined above with a p-methoxyphenylglyoxal lower alkyl hemimercaptal to prepare a thio compound of the formula:



in which R is lower alkyl and R^1 is as defined above, and reacting said thio compound with a borohydride reducing agent.

4,540,820

PRODUCTION OF ANIMAL FEED GRADE BIURET

Kurt F. Stephan, Wenatchee, and John T. Stephan, East Wenatchee, both of Wash., assignors to Moorman Manufacturing Company, Quincy, Ill.

Continuation-in-part of Ser. No. 265,550, May 20, 1981, , which is a continuation-in-part of Ser. No. 178,132, Aug. 15, 1980, abandoned. This application Jan. 3, 1983, Ser. No. 455,326

Int. Cl.³ C07C *127/24*

U.S. Cl. 564—38 **8 Claims**

1. The process of preparing animal feed grade biuret, comprising; preparing a feedstock by heating a urea charge at a temperature of between about 145° C. and about 165° C. while simultaneously blowing a non-reactive gas at superatmospheric pressure through the molten urea charge at an aeration rate of from about two to about ten cubic feet of gas/hour/lb. of urea for at least about four hours and until the urea content of the product is reduced to between about 37% and about 25% urea, the cyanuric acid content is between about 3% and about 20% and the melting point of the product is between about 110° C. and about 130° C., by weight; cooling and comminuting the product to form such feedstock; containing the comminuted feedstock as a bed of several inches thickness in a recirculating oven, and passing heated recirculated gas through the bed of feedstock at a temperature slightly below the melting point of the feedstock until the urea content thereof is less than about 15% by weight.

4,540,821

AMINOPOLYOLS FROM SUGARS

John M. Larkin, Austin; Ernest L. Yeakey, Houston, and Lewis W. Watts, Jr., Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 26, 1981, Ser. No. 228,436

Int. Cl.³ C07C *85/08*

U.S. Cl. 564—473 **3 Claims**

1. A method for controlling the degree of amination in the continuous production of a mixture of aminopolyols containing primarily polyamino polyols comprising

(a) pumping an aqueous solution of sugars and ammonia to a reaction zone in separate streams,
(b) continously reacting the aqueous solution of sugars with ammonia in the presence of hydrogen and a hydrogenation-dehydrogenation catalyst and
(c) controlling the degree of amination of the resulting aminopolyols by
(1) increasing or decreasing the reaction temperature between 150° and 250° C. to increase or decrease the degree of amination respectively,
(2) decreasing or increasing the space velocity of the reaction mass to increase or decrease the degree of amination respectively, and
(3) decreasing or increasing the mole ratio of ammonia to sugars between 30 and 1 to increase or decrease the degree of amination respectively.

4,540,822

REGENERATIVE PROCESS FOR THE PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES USING A SUPPORTED CATALYST

Steven H. Vanderpool, New Braunfels, Tex., assignor to Texaco, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 455,160, Jan. 3, 1983,. This application Nov. 22, 1983, Ser. No. 553,333
Int. Cl.³ C07C *85/06*
U.S. Cl. 564—479 **11 Claims**

1. In a method wherein monoethanolamine is continuously reacted with ethylenediamine in a reaction zone in the presence of a pelleted catalyst under conversion conditions including a temperature of from about 250° C. to about 400° C. and a pressure of from about 500 to about 3000 psig. to provide an essentially noncyclic reaction product comprising polyethylenepolyamines, wherein the catalyst comprises a group IVb metal oxide support having from about 0.5 to about 10 wt. % of phosphorous thermally chemically bonded to at least the surface thereof and wherein said pelleted catalyst becomes at least partially deactivated with the passage of time:

The improvement which comprises:

(a) regenerating said catalyst for further use in said continuous process at a catalyst activating temperature of from about 450° C. to about 700° C. with an oxygen-containing gas for a period of time within the range of about 2 to 12 hours sufficient to regenerate said catalyst; and
(b) thereafter again initiating the continuous reaction of monoethanolamine with ethylenediamine in said reaction zone in the presence of said thus regenerated catalyst under said conversion conditions to provide an essentially noncyclic product comprising polyethylenepolyamines.

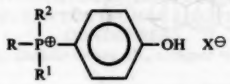
4,540,823

TETRAHYDROCARBYL PHOSPHONIUM SALTS

George A. Doorakian, Bedford, and Joseph W. Hanafin, Framingham, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 515,824, Jul. 21, 1983, Pat. No. 4,477,645. This application Jun. 15, 1984, Ser. No. 620,976
Int. Cl.³ C08G *59/00*
U.S. Cl. 568—10 **4 Claims**

1. A compound corresponding to the formula



wherein R and R^2 are each independently phenyl or hydroxyphenyl R^1 is a C_1 to C_4 alkyl and $X^{\ominus}$ is fluoride, bromide, chloride, iodide, carboxylate, bicarbonate, biphosphate, phenate or bisphenate.

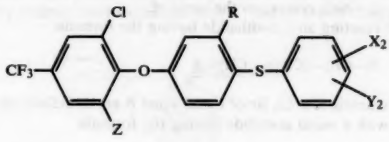
4,540,824

DIPHENYL SULFIDE COMPOUNDS USEFUL AS INTERMEDIATES IN THE PRODUCTION OF DIPHENYL SULFONE COMPOUNDS

Hiroyuki Konishi; Naganori Hino; Hiroshi Matsumoto, all of Osaka, and Ryo Yoshida, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 442,375, Nov. 17, 1982, Pat. No. 4,486,223, which is a continuation-in-part of Ser. No. 318,999, Nov. 6, 1981, Pat. No. 4,374,662. This application May 15, 1984, Ser. No. 610,497
Claims priority, application Japan, Nov. 17, 1980, 55-162319
Int. Cl.³ C07C *149/34, 149/36*
U.S. Cl. 568—45 **10 Claims**

1. A compound of the formula:



wherein R is a hydrogen atom or a lower alkoxy group, X_2 and Y_2, being the same or different, are each a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group and Z is a hydrogen atom or a halogen atom.

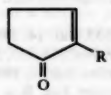
4,540,825

METHOD FOR PRODUCING 2-CYCLOPENTENONES

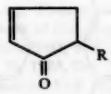
Katsuyuki Shiota, Toyonaka; Kunihiko Tanaka, Nara, and Masayoshi Minai, Moriyama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 2, 1984, Ser. No. 595,681
Claims priority, application Japan, Apr. 19, 1983, 58-69566
Int. Cl.³ C07C *45/67*
U.S. Cl. 568—341 **2 Claims**

1. A method for producing a 2-cyclopentenone represented by the formula,



wherein R represents an alkyl, alkenyl or cycloalkyl group having 7 or less carbon atoms respectively, or a phenyl, tolyl or benzyl group, which comprises heating a 4-cyclopentenone represented by the formula,



wherein R has the same meaning as above, in the presence of 1,8-diaza-bicyclo[5,4,0]undecene or its organic acid salt wherein the organic acid is phenol, cresol, oleic acid or octylic acid.

4,540,826

PROCESS FOR PREPARING OLEFINIC ALDEHYDES

Dennis S. Banasiak, and Jim D. Byers, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 12, 1983, Ser. No. 522,774
Int. Cl.³ C07C 45/28
U.S. Cl. 568—420 12 Claims

1. A process for the preparation of an olefinic aldehyde having the formula:

$$H-(CR_2)x-CH_2-CH=CH-CH_2-(CR_2)y-CHO$$

wherein x=0-20, inclusive, y=1-20, inclusive, and each R is independently H, C_1-C_{20} alkyl, cycloalkyl, aryl, aralkyl, and alkaryl which comprises the steps of:

(a) reacting an α,ω-dihalide having the formula:

$$X-CH_2-(CR_2)y-CH_2-X$$

wherein X is Cl, Br or I, and y and R are as defined above, with a metal acetylide having the formula:

$$M-C\equiv C-CH_2-(CR_2)x-H$$

wherein M is Li or Na and x and R are as defined above to give a reaction product containing an acetylenic halide having the formula:

$$H-(CR_2)x-CH_2-C\equiv C-CH_2-(CR_2)y-CH_2-X$$

wherein x, y, R and X are as defined above;

(b) hydrogenating the acetylenic halide obtained in (a) with hydrogen and a selective hydrogenation catalyst to give an olefinic halide having the formula:

$$H-(CR_2)x-CH_2-CH=CH-CH_2-(CR_2)y-CH_2-X$$

wherein x, y, R and X are as defined above; and

(c) oxidizing the olefinic halide obtained in (b) to give said olefinic aldehyde.

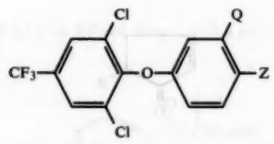
4,540,827

PHENOXYBENZENE DERIVATIVES

Heinz Forster, Wuppertal; Ludwig Eue, Leverkusen, and Robert Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 513,933, Jul. 14, 1983, Pat. No. 4,482,736, which is a division of Ser. No. 318,899, Nov. 6, 1981, Pat. No. 4,435,208. This application Jun. 1, 1984, Ser. No. 616,355
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044810
Int. Cl.³ C07C 47/546, 43/263, 79/35, 79/36
U.S. Cl. 568—442 3 Claims

1. A phenoxybenzene derivative of the formula



in which

Q represents —CH_2OH and Z represents NO_2, or

Q represents CHO and Z represents hydrogen.

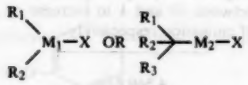
4,540,828

CATALYSTS FOR ALKOXYLATION REACTIONS

Kang Yang, Ponca City, Okla., assignor to Vista Chemical Company, Houston, Tex.

Division of Ser. No. 383,387, Jun. 1, 1982, abandoned. This application Feb. 25, 1983, Ser. No. 469,550
Int. Cl.³ C07C 41/03
U.S. Cl. 568—616 2 Claims

1. A method for the alkoxylation of an alcohol to yield a sharply peaked alkoxylate distribution comprising contacting, in the absence of water said alcohol with an alkoxylating agent in the presence of a catalyst comprising at least one material of the general formula



at a temperature of about 25° C. to about 200° C. for a time sufficient to alkoxylate to the extent desired, wherein x is a halogen selected from the group consisting of chlorine and fluorine, R_1, R_2 and R_3 are, independently, hydrogen, alkyl groups containing from 1 to 20 carbon atoms, alkoxide groups containing from 1 to 20 carbon atoms, and halogen, wherein at least one of R_1, R_2 or R_3 must be alkyl or alkoxide, wherein M_1 is selected from the group consisting of aluminum, gallium, indium and thallium and M_2 is selected from the group consisting of titanium, zirconium and hafnium.

4,540,829

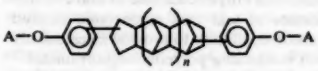
ALLYLATED DI OR POLYCYCLOPENTADIENE DIPHENOLS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

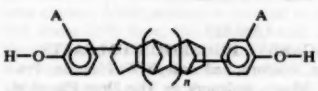
Continuation-in-part of Ser. No. 446,090, Dec. 2, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,762
Int. Cl.³ C07C 43/205, 43/21, 39/15
U.S. Cl. 568—634 13 Claims

1. A new composition of matter represented by the following Formulas I, II, III, IV, V, VI, VII, VIII, IX, X, and XI

I.

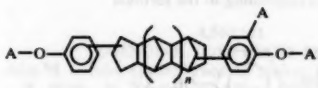


II.

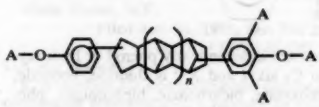


III.

IV.



V.



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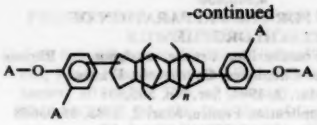
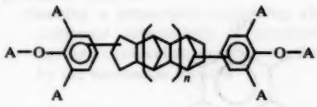
VI.

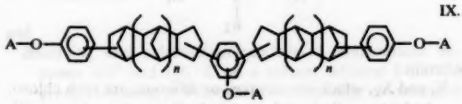


VII.

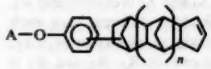
VIII.



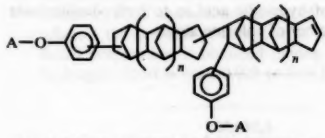
IX.



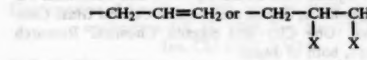
X.



XI.



wherein each A is independently a group represented by the formulas



X is a halogen and n has an average value from zero to about 20.

4,540,830

ANTI-JUVENILE HORMONES

William S. Bowers, Geneva, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 239,745, Mar. 2, 1981, Pat. No. 4,347,256. This application Jun. 16, 1982, Ser. No. 389,135

Int. Cl.³ C07C *43/02*

U.S. Cl. 568—651 **1 Claim**

1. 2-isopentenyl-4-methoxy-5-ethoxyphenol.

4,540,831

MIXED-PHASE HYDROCARBON CONVERSION PROCESS EMPLOYING TOTAL OVERHEAD CONDENSER

Bruce A. Briggs, Buffalo Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed May 17, 1984, Ser. No. 611,459

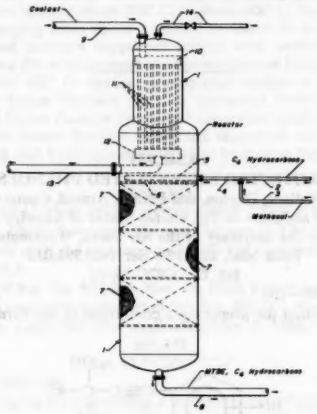
Int. Cl.³ C07C *41/06, 43/04, 29/04, 39/06*

U.S. Cl. 568—697 **10 Claims**

1. An exothermic etherification process for the continuous reaction of an olefinic hydrocarbon having less than six carbon atoms per molecule with an alcohol which comprises the steps of:

(a) passing said olefinic hydrocarbon and said alcohol into a reaction zone maintained at reaction-promoting conditions and containing a solid etherification catalyst which promotes said exothermic etherification between said olefinic hydrocarbon and said alcohol to form a corresponding ether compound which is less volatile than said alcohol and said olefinic hydrocarbon, and with a vapor phase being forward within the reaction zone at least in part by the vaporization of said alcohol, olefinic hydrocarbon or both, said alcohol and olefinic hydrocarbon vaporized as a result of heat released in said exothermic reaction;

(b) condensing substantially all of the condensible vapor in said vapor phase in an upper portion of said reaction zone by indirect heat exchange with a fluid of lower tempera-



ture than said vapor phase to form a condensate liquid phase containing substantially all of said condensibles present in the vapor phase including both reactants comprising said olefinic hydrocarbon and said alcohol in liquid phase;

(c) passing downwardly through the reaction zone from a point elevated with respect to the etherification catalyst all of said condensate liquid phase including both said reactant within said reaction zone;

(d) removing said formed ether compounds as a liquid phase effluent stream from a bottom portion of said reaction zone in accompaniment with substantially all of said alcohol and olefinic hydrocarbon added to said reaction zone in step (a) and not consumed in said etherification reaction zone; and

(e) recovering said ether compound from said liquid phase effluent stream.

4,540,832

PROCESS FOR THE PREPARATION OF 6-CHLORO-2,4-DINITROPHENOL

Otto Arndt, Hofheim am Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 604,072

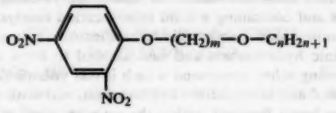
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1983, 3315798

Int. Cl.³ C07C *79/28, 79/32*

U.S. Cl. 568—711 **8 Claims**

1. A process for the preparation of 6-chloro-2,4-dinitrophenol in a high yield and in a high degree of purity by saponi-

fying 2,4-dinitrochlorobenzene or 2,4-dinitrophenyl alkyl ethers of the formula



in which m denotes the number 2, 3 or 4 and n denotes the number 1 or 2, by means of aqueous sodium hydroxide or potassium hydroxide solution and chlorinating the resulting 2,4-dinitrophenol with sodium hypochlorite, which comprises chlorinating the resulting 2,4-dinitrophenol, without prior isolation as an intermediate, in aqueous suspension at a pH value of 3.5–7 by means of chlorine bleach liquor at temperatures of 5° to 20° C.

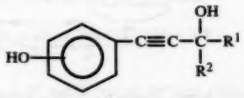
4,540,833

PROTECTED ETHYNYLATED PHENOLS

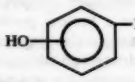
J. Shield Wallace, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 21, 1984, Ser. No. 592,033
Int. Cl.³ C07C *39/11*
U.S. Cl. 568—766 **5 Claims**

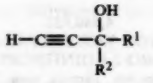
1. A method for preparing a compound of the formula



wherein R^1 and R^2 are the same or different and are selected from the group consisting of hydrogen, C1 to C4 alkyl, phenyl and substituted phenyl, and wherein R^1 and R^2 together with the carbon atom to which they are attached form a saturated 5- or 6-membered ring, which comprises the steps of reacting a halophenol of the formula



wherein X is —F, —Cl or —Br, with an acetylenic compound of the formula



wherein R^1 and R^2 are as defined above, in the presence of an amine solvent, a catalytic amount of a palladium complex catalyst system and a promoting amount of a cuprous salt promoter under reaction conditions, and recovering the resulting protected ethynylated phenol compound wherein said reaction conditions include a temperature of about 20° to 200° C., a reaction pressure of atmospheric up to about 250 psig, and a reaction time of about 1 to 150 hours.

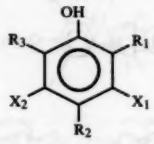
4,540,834

PROCESS FOR THE PREPARATION OF METACHLOROPHENOLS

Georges Cordier, Francheville, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Mar. 2, 1984, Ser. No. 585,503
Claims priority, application France, Mar. 2, 1983, 83 03648
Int. Cl.³ C07C *39/27*
U.S. Cl. 568—774 **25 Claims**

1. A process for the preparation of a meta-chlorophenol, comprising selectively hydrodechlorinating with hydriodic acid, in liquid phase, a polychlorophenol having the general formula (I):



wherein

X_1 and X_2, which are identical or different, are each chloro, hydrogen, alkyl, aryl, arylakyl, alkoxy or aryloxy, with the proviso that at least one of X_1 and X_2 is chloro, and R_1, R_2, and R_3, which are identical or different, are each chloro, hydrogen, alkyl, aryl, arylakyl, alkoxy or aryloxy, with the proviso that at least one of R_1, R_2 and R_3 is chloro, said reaction being carried out in the presence of such amount of hydriodic acid as to hydrodechlorinate the desired number of chlorine atoms.

4,540,835

PREPARATION OF 2-TRIFLUOROMETHYLPROPANOL BY VAPOR PHASE HYDROGENATION OF 2-TRIFLUOROMETHYLPROPANAL

Toshikazu Kawai, Kamifukuoka; Akira Negishi, Sayama, both of Japan; Iwao Ojima, East Setauket, N.Y., and Takamasa Fuchikami, Sagamihara, Japan, assignors to Central Glass Company Limited, Ube City and Sagami Chemical Research Center, Tokyo, both of Japan

Continuation-in-part of Ser. No. 441,766, Nov. 15, 1982, abandoned. This application May 17, 1984, Ser. No. 611,081
Claims priority, application Japan, Nov. 18, 1981, 56-183718
Int. Cl.³ C07C *31/38, 29/132*
U.S. Cl. 568—842 **8 Claims**

1. A process of preparing 2-trifluoromethylpropanol, comprising the step of allowing a vaporized trimer of 2-trifluoromethylpropanal to contact and react with hydrogen gas in the presence of a catalyst which comprises reduced nickel as a principal component thereof.

4,540,836

HEMOLOGATION OF ALKANOLS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 24, 1984, Ser. No. 643,835
Int. Cl.³ C07C *29/00, 31/08, 31/20, 33/22*
U.S. Cl. 568—902 **22 Claims**

1. A process for converting an alcohol reactant into alcohols, having at least one or more carbon atoms than said alcohol reactant, which comprises contacting a solution, having a pH of greater than 7.0 and comprising said alcohol reactant, with carbon monoxide, in the presence of a catalyst comprising lanthanum, and in the absence of added hydrogen.

4,540,837

PROCESS FOR THE WORK-UP OF RESIDUES OF CHLORINATION

Ludwig Schmidhammer, Haiming; Gerhard Dummer, Burgkirchen; Klaus Haselwarter, and Rudolf Strasser, both of Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 3, 1983, Ser. No. 519,969

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233640; Sep. 30, 1982, 3236323

Int. Cl.³ C07C *17/38*

U.S. Cl. 570—211 7 Claims

1. A process for the work-up of chlorination residues, comprising the steps of:

obtaining a preparation containing chlorination residues composed substantially of perchlorinated compounds having a chemical composition represented approximately by the summation formula

$$C_{5\text{-}6}Cl_{5.8\text{-}6.0}$$

and

dissolving said chlorination residues at temperatures between 100° and 180° C. in a solvent selected from the group consisting of hydrocarbons containing chlorine and oxygen, in which the ratio of hydrogen:chlorine is 0.028–0.06:1 by weight, the ratio of oxygen:carbon is between 0.0038–0.0089:1 by weight, the atomic ration of carbon to hydrogen is from 1:1.1–1.9, hydrocarbons having a boiling point between 160° and 180° C. at one bar abs. in which the atomic ratio of carbon:hydrogen is between 1:1.85–2 and a combination of said hydrocarbons, wherein the amounts of components are so chosen that a liquid preparation is obtained having a weight ratio of hydrogen:chlorine from 0.028 to 0.05:1.

4,540,838

PROCESS FOR PRODUCING CHLOROPRENE

Takao Iwasaki; Higashi Ito, and Seiichi Watanabe, all of Ohmi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 37,780, May 10, 1979, abandoned. This application Jul. 31, 1980, Ser. No. 174,260

Int. Cl.³ C07C *17/34*

U.S. Cl. 570—229 9 Claims

1. A process for producing chloroprene, comprising:

reacting 3,4-dichlorobutene-1 with a base in an aqueous solution in the presence of tetrahydrofurfuryl alcohol at a temperature of 20° to 70° C.

4,540,839

PROCESS FOR THE PRODUCTION OF POLYMER GASOLINE

Donald A. Keyworth, Houston, and Cecil G. McFarland, League City, both of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Mar. 26, 1984, Ser. No. 593,378

Int. Cl.³ C07C *2/04*

U.S. Cl. 585—520 33 Claims

1. A process for producing polymer gasoline comprising contacting a hydrocarbon stream substantially free of isobutene containing at least 40 mole % normal C_4 alkenes, in liquid phase with an acidic cation exchange resin at a temperature in the range of 80° C. to 130° C. at LHSV in the range of 2 to 5 in the presence of 1 to 5 weight %, based on said hydrocarbon stream, of a catalyst modifier of methyl tertiary butyl ether, secondary butyl methyl ether, toluene or mixtures thereof, whereby a product stream is produced comprising oligomers and unreacted material said oligomers being principally dimers of said normal alkenes.

4,540,840

CATALYSIS OVER ACTIVATED HIGH SILICA ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 552,545, Nov. 16, 1983, which is a continuation-in-part of Ser. No. 355,418, Mar. 8, 1982, Pat. No. 4,427,786. This application Nov. 5, 1984, Ser. No. 668,352

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—640 18 Claims

1. A process for converting a feedstock comprising an alcohol, ether or mixture thereof to conversion product comprising hydrocarbons which comprises contacting said feedstock at conversion conditions with a catalystt composition comprising a supported crystalline zeolite having an initial silica-to-alumina mole ratio greater than about 100 prepared by a method which comprises compositing said crystalline zeolite with a support matrix material of alumina, gallia or a combination thereof, calcining the resulting supported zeolite at a temperature of from about 200° C. to about 600° C. for a period of time ranging from about 1 minute to about 48 hours, contacting said calcined supported zeolite with volatile boron fluoride in a dry environment at a temperature of from about 0° C. to about 100° C. until said supported zeolite is saturated with said boron fluoride, purging unreacted boron fluoride from said boron fluoride contacted supported zeolite, hydrolyzing said boron fluoride contacted supported zeolite, and converting said hydrolyzed material to hydrogen form.

4,540,841

CATALYSIS OVER ACTIVATED ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 552,544, Nov. 16, 1983, Pat. No. 4,500,271, which is a continuation-in-part of Ser. No. 355,417, Mar. 8, 1982, Pat. No. 4,427,790. This application Nov. 5, 1984, Ser. No. 668,351

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—640 20 Claims

1. A process for converting a feedstock comprising an alcohol, ether or mixture thereof to conversion products comprising hydrocarbons which comprises contacting said feedstock at conversion conditions with a catalyst comprising a zeolite composition prepared by a method comprising reacting a porous crystalline zeolite having an initial silica-to-alumina mole ratio greater than about 100 with a reagent having the formula:

$$L_{(n-m)}(MF_n)_e$$

wherein L is an organic or inorganic ionic moiety, (MF_n) is a fluoroanion moiety comprising the element M, M is an element selected from the group consisting of elements from Groups VB, VIB, VIIB, VIII, IIIA, IVA and VA of the Periodic Table of the Elements and Rare Earth elements, n is the coordination number of M, m is the valence of M and e is the charge associated with L, said reaction of said zeolite with said reagent being conducted at a temperature of from about −70° C. to about 80° C. and a pressure of from about −0.8 psig to about 50 psig.

4,540,842

REMOVAL OF SULFUR COMPOUNDS FROM PENTANE

George C. Allen, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Jan. 16, 1984, Ser. No. 571,312

Int. Cl.³ C07C *7/12, 7/13;* C10G *29/00*

U.S. Cl. 585—823 8 Claims

1. A process for the removal of carbon disulfide and other sulfur contaminants from pentane which comprises:

contacting pentane in a first contacting zone with an adsorbent consisting essentially of molecular sieve; contacting pentane from said first zone in a second contacting zone with an adsorbent consisting essentially of activated carbon, and recovering pentane product substantially free of carbon disulfide and other sulfur contaminants from said second zone.

4,540,843

SOLAR CELL

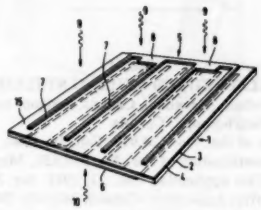
Hans Gochermann, Holm; Wilfried Schmidt; Klaus-Dieter Rasch, both of Talheim, and Karl-Heinz Tentscher, Heilbronn, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main and Telefunken Electronic GmbH, Heilbronn, both of, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 585,221

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1983, 3308269

Int. Cl.[3] H01L *31/06*

U.S. Cl. 136—251 23 Claims



1. A solar cell comprising: a plate-shaped semiconductor body, containing a pn-junction (4) and having front and rear opposite surface sides (15, 16) and a base zone (2) of a first conduction type disposed on one surface side, for exposure to rays on both sides, wherein the semiconductor base zone (2) of the first conduction type is uniformly doped; a thin zone (3) of a second conduction type with a higher doping than the base zone disposed on the other surface side of the semiconductor body; front and rear structured conduction path systems (5, 6) each including a contact having spaced apart adjacent structures, wherein said zones (2, 3) of the solar cell are each in contact with a respective one of said structured conduction path systems so as to leave substantial areas of the semiconductor surface uncovered, wherein the doping of the semiconductor base zone (2) of the first conduction type is relatively high and the spacing between the adjacent structures (11) of the rear side conduction path system (6) is relatively small whereby the resulting fraction of the series resistance of the cell is small compared to the total series resistance, and wherein the distances between the structures (7) of the conduction path system (5) in the case of the front side contact are larger than those in the case of the rear side contact (6).

20. A solar generator comprising a plurality of solar cells each according to claim 1, in which the cells are transparently encapsulated or covered on both sides.

4,540,844

ELECTRICAL IONIZING DEVICES FOR LIGHTNING PROTECTION

Michel Sautereau, Boulogne; Roger Nicod, Amboise, and Pierre Langlois, Paris, all of France, assignors to Societe Francaise Helita, Paris, France

Filed Mar. 28, 1984, Ser. No. 594,356

Int. Cl.[3] H02G *13/00*

U.S. Cl. 174—3 4 Claims

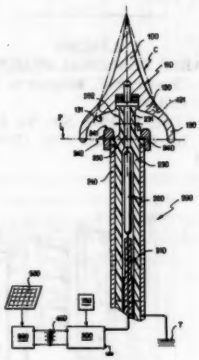
1. A device for protection against lightning including:

a lightning rod point (100), the lateral surface (110) of which is a rotation surface inscribed in an enveloping cone (C),

a conductive rod (210) connected to the potential of the earth and supporting said point, said rod being hollow and housing a central core (220), which core is electrically connected to the point and protected by an insulating sheath (230) of said rod,

a high-tension source (300) for bringing said point to an elevated potential capable of generating an emission of ions by Corona effect, and a spark-gap device that makes it possible electrically to connect said point to the earth in case the latter is subjected to a thunderbolt or other excessive tension, said spark-gap device including an upper armature formed by the base (120) of said point (100) and a lower armature including a conductive crown (240) connected to said rod (210) and situated opposite the base of said point and spaced therefrom,

characterized in that said base of said point is lengthened by a flared protective skirt (130) extending downwardly so as to cover at least partially said conductive crown (240), the distance separating the internal surface (131) of said skirt from the lateral surface (241, 242) of said



conductive crown remaining always at least equal to the distance between said armatures of said spark gap,

said insulating sheath (230) is upwardly extended until reaching the base of said point and has, specially on the portion (231) situated at the height of the dielectric interval between said armatures of said spark gap, a narrowing (D) of its diameter so as to increase the distance between the surfaces (232; 131, 241) facing said sheath and said armatures of said spark gap,

the roughness R_a of said internal surface (131) of said skirt is less than 0.2 μm.

4,540,845

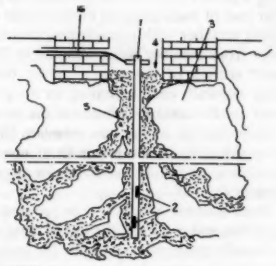
METHOD AND COMPOSITION FOR PROTECTING AN ELECTRICAL GROUNDING DEVICE

Pasquale Frola, Via Alcide Cervi, 41, Naples, Italy

Filed Apr. 16, 1984, Ser. No. 600,927

Int. Cl.[3] H01R *4/66;* C23F *11/00;* C09K *15/02*

U.S. Cl. 174—7 6 Claims



1. The method of providing corrosion protection for an electrical grounding device of the type which comprises a tubular metallic grounding electrode located in the earth and having small openings in the lower end thereof; comprising,

injecting a viscous anticorrosive material into said tubular electrode under pressure sufficient to extrude said material through said openings into the surrounding earth to substantially fill the interstices between said tube and the adjacent earth, said anticorrosive material comprising an admixture of SiO_2, Al_2O_3 and Fe_2O_3 with sufficient water to render the admixture viscous.

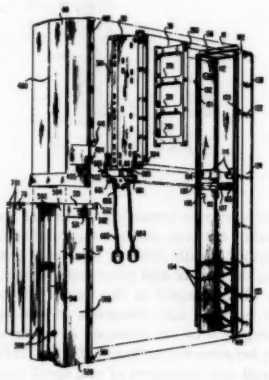
6. A composition of matter for the protection of a buried electrical grounding device against corrosion, said composition comprising by weight about 61% SiO_2, 15% Al_2O_3, 13% Fe_2O_3, 5% CaO,3% MgO, 0.5% Mn_2O_3, 0.7% ZnO, 1.0% Cr_2O_3, and 0.8% TiO_2.

4,540,846

CABLE TERMINAL PEDESTAL

Arnold R. Smith, Chester, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 29, 1982, Ser. No. 454,160
Int. Cl.³ H02G *9/02, 15/06*
U.S. Cl. 174—38 **13 Claims**



1. A pedestal cable closure for above-ground terminals of a buried cable installation comprising:

a rear member having a vertically elongated rear wall and forwardly projecting sidewalls, the sidewalls each including a groove extending essentially the length of the sidwalls, the rear member also having upper and lower sections, the upper section including a raised flange on its upper surface extending between the sidewalls, an internal flange in the groove of each sidewall, the lower section including a pair of apertures at one end and projections at the other end of each sidewall of the lower section;

a lower front member with rearwardly extending sidewalls, the lower front member being adapted to fit securely to the lower section of the rear member, the rearwardly extending sidewalls each including an integral snap latch tab at one end for mating with one of the pair of apertures in the lower section of the rear member, the rearwardly extending sidewalls of the lower front member each including a hook projecting therefrom for engagement with the projections; and

an upper front member adapted to be secured to the upper section of the rear member, the upper front member having rearwardly projecting sidewalls for engagement with the grooves, the upper front member including a pair of hooks projecting from the sidewalls for extending into the grooves to engage with the internal flanges and a raised lip adapted to slide over the raised flange of the rear member to provide a weatherproof assembly on the top of the pedestal cable closure.

11. A pedestal cable closure for above ground terminals of buried cable installations, the closure comprising:

a rear member with outwardly projecting siderails; and

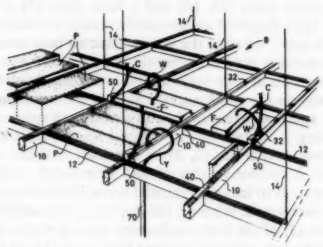
a flood cover member including an elongated member having a cavity with an opening in its bottom surface for installation over the rear member, and a closed end located at the end of the cavity for preventing the leaking of air, the bottom surface of the elongated member disposed between the opening and bottom periphery of the elongated member having an array of venting apertures, and means for securing the flood cover member to the rear member.

4,540,847

ELECTRIFIED CEILING SYSTEM

Arthur W. Gardner, Markham, Canada, assignor to CDA Industries, Inc., Scarborough, Canada

Continuation of Ser. No. 124,918, Feb. 26, 1980, abandoned, which is a continuation of Ser. No. 910,631, May 30, 1978, abandoned. This application Dec. 22, 1981, Ser. No. 333,533
Claims priority, application Canada, May 31, 1977, 279569
Int. Cl.³ H02G *3/28*
U.S. Cl. 174—48 **25 Claims**



12. A ceiling structure adapted for the receipt of electrical wiring therein, said ceiling structure comprising;

a plurality of longitudinal parallel channel members each having a bottom wall and side walls joined to form an integral structure, and flange means along the upper edges of their side walls;

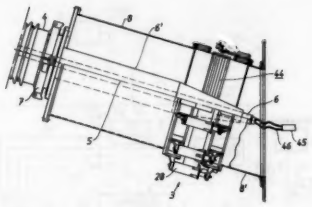
a plurality of transverse channel members extending between said longitudinal members, each said transverse member having a bottom wall, and side walls joined to form an integral structure and flange means along the upper edges of their side walls, lying co-planar with said flange means of said longitudinal members, each transverse member being open at each end, each end being adapted to generally abut against a side wall of a longitudinal member and be held thereagainst by a connection means, said connection means comprising a junction plate means adapted to be attached to said side wall of a longitudinal member, and a connector means adaptable to be attached to a said transverse member at a said open end, said junction plate means and said connector means being interengagable with each other to secure said transverse member to said longitudinal member, said flange means of said side walls of said longitudinal and transverse members thereby providing support means for ceiling fixtures, ceiling panels, and the like, in a predetermined plane located above the plane of said bottom wall and said side walls of said longitudinal and transverse members, and

suspension means on at least some of said members, whereby the same may be suspended in position.

4,540,848
ELECTRIC HIGH-VOLTAGE EARTHQUAKE-RESISTANT BUSHING

Ole Beijar, and Mats Mattsson, both of Ludvika, Sweden, assignors to Asea AB, Västerås, Sweden

Filed Jul. 18, 1984, Ser. No. 632,073
Claims priority, application Sweden, Aug. 4, 1983, 8304264
Int. Cl.[3] H01B *17/26;* H01F *27/04*
U.S. Cl. 174—152 R 2 Claims



1. An electric high-voltage bushing (2) for an electric apparatus enclosed in a casing (1), said bushing comprising an elongated tube (4) made of insulating material and having a longitudinal axis (5), a conductor (6) extending along said axis, said conductor being surrounded by said tube and electrically connected to said apparatus, and a flexible device (3) constituting a mechanical connection between said tube and said casing, wherein said flexible device (3) comprises a first annular member (9) enclosing said axis, a second annular member (10) enclosing said axis and a force transmitting ring (11) enclosing said axis, said first annular member (9) being mechanically connected to said tube (4), said second annular member (10) being mechanically connected to said casing (1), said first annular member (9) being arranged in axially spaced relationship with said second annular member (10), said ring (11) being arranged with rotatability in relation to said first and said second annular members about a first (19) and a second (18), respectively, transversally directed axis of rotation by means of a first bearing device and a second bearing device, respectively, said first bearing device (24, 25, 26, 27) being fixed to said first annular member (9), said second bearing device (20, 21, 22, 23) being fixed to said second annular member (10), said first axis of rotation (19) being perpendicularly oriented with respect to said second axis of rotation (18); a plurality of spring devices (28) being attached to said annular members, each spring device (28) constituting a flexible mechanical connection between said first annular member (9) and said second annular member (10).

4,540,849
METER INTERFACE UNIT FOR UTILITY METER READING SYSTEM

Stewart W. Oliver, Venice, Calif., assignor to International Teldata II Corp., Los Angeles, Calif.

Filed Jun. 8, 1983, Ser. No. 502,201
Int. Cl.[3] H04M *11/00*
U.S. Cl. 179—2 AM 12 Claims

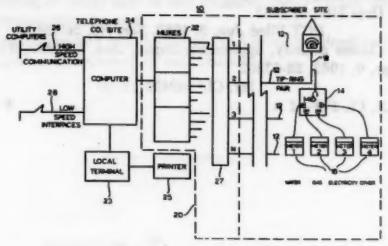
1. An interface device connectable in parallel with a telephone subset and to a source of utility usage information associated with the location of the telephone subset for sending utility usage information over a telephone line comprising:

converting means coupled to at least one utility monitoring device and to the telephone line for converting utility usage information from at least one utility monitoring device into alternating current representations and for sending the alternating current representation over the telephone line;

means coupled to the telephone line for detecting a preselected interrogation signal from the telephone line;

means for detecting an OFF-HOOK condition on the telephone line;

said last means responsive to an OFF-HOOK condition for disabling said interface device from responding to interrogation signals;



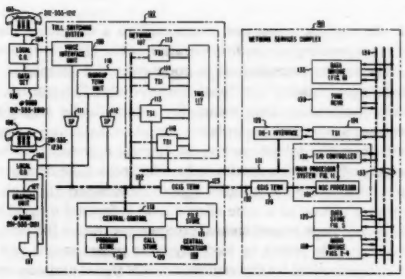
each of said means being powered by ON-HOOK current on said telephone line when in an idle line condition;

said interface device being operationally responsive to interrogation signals only of a voltage higher than the OFF-HOOK voltage at the telephone subset.

4,540,850
METHOD AND APPARATUS FOR CONTROLLING A CONFERENCE

Diane E. Herr, Warrenville, Ill.; Laddie E. Suk, Readington, N.J., and David F. Winchell, Glen Ellyn, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 29, 1983, Ser. No. 489,805
Int. Cl.[3] H04M *3/56, 11/00*
U.S. Cl. 179—2 DP 6 Claims



1. For use in communications system comprising a plurality of stations and a conference bridge, a method for controlling connections to said bridge comprising the steps of

connecting selected ones of said stations to said bridge,

detecting when one of the selected stations has disconnected from the bridge,

signaling the stations remaining connected to the bridge that said one selected station has disconnected,

ascertaining the identity of said one disconnected station in response to a signal from said selected station,

transmitting to a particular one of said remaining stations the identity of said disconnected station, and

reconnecting said identified station to said bridge in response to a signal transmitted by said particular remaining station.

4,540,851

REMOTE CONTROL DEVICE USING TELEPHONE CIRCUIT OF ELECTRIC APPARATUS

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

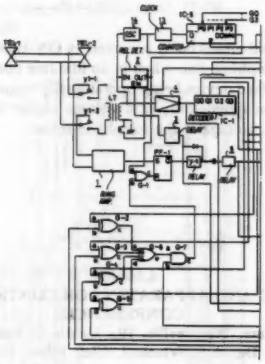
PCT No. PCT/JP83/00171, § 371 Date Dec. 14, 1983, § 102(e) Date Dec. 14, 1983, PCT Pub. No. WO83/04362, PCT Pub. Date Dec. 8, 1983

PCT Filed Jun. 5, 1982, Ser. No. 567,869

Claims priority, application Japan, Jun. 5, 1982, 57-96794; Apr. 9, 1983, 58-62562

Int. Cl.³ H04M *11/00*

U.S. Cl. 179—2 A 8 Claims



1. An electric apparatus, connected to a telephone circuit and incorporating means for operation of the electric apparatus in response to reception of a code over the telephone line consisting of "dialed" or "push button-entered" numbers, said means comprising: loop means for automatically engaging a telephone set with the telephone circuit by detecting a ringing signal from the telephone set; an electric apparatus having a plurality of operation modes to be selected; a tone decoder for converting a remote control signal transmitted through the telephone circuit to a code after a loop is formed by said loop means; key code preset means; comparator means for comparing a key code preset by said key code preset means and the key code supplied by the remote control signal and converted by said tone decoder; means for disengaging the loop engaged by said loop means in accordance with a noncoincidence signal from said comparator means; selecting means for selecting a desired operation mode of said electric apparatus in accordance with an output from said tone decoder; operation time interval preset means for presetting an operation time interval of said electric apparatus in accordance with the output from said tone decoder; a counter for setting an output for selecting the operation mode and/or the operation time interval of said electric apparatus from said tone decoder; pulse generating means for generating pulses the number of which corresponds to a count set in said counter; and audible signal oscillating means for transmitting an audible signal onto the telephone circuit in response to an output from said pulse generating means.

4,540,852

ELECTRONIC SUBSCRIBER JUNCTOR

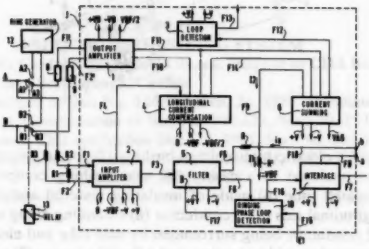
Pierre Albouy, Lannion; Yves Salahun, Trebeurden; Francois Botquin, Lannion, and Roberto Cordani, Garches, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed May 19, 1983, Ser. No. 496,152

Claims priority, application France, May 19, 1982, 82 08766

Int. Cl.³ H04B *1/58*

U.S. Cl. 179—18 FA 10 Claims



1. An electronic subscriber junctor for connecting a subscriber line to a telephone exchange and including both an input amplifier circuit generating a compensation voltage (Umc) proportional to a common mode voltage occurring on the line, and an output amplifier circuit powered from a battery and having its output connected to the two wires of the subscriber line, the improvements wherein:

the input amplifier circuit includes means for generating a current proportional to the line voltage;

and wherein the junctor further includes:

a filter having its input connected to the input amplifier and serving to separate the AC and the DC components of said current which is proportional to the line voltage by means of a single capacitive component, said filter having a first output delivering a voltage proportional to the AC component of the line voltage and second output delivering a voltage proportional to the DC component of the line voltage;

first means for connecting the first filter output to the exchange and for delivering a current is proportional to the current flowing in a link to the exchange;

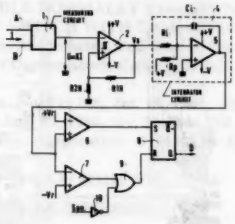
second means connected to said first means and to said second output from the filter and including means for obtaining a constant current, and for summing said constant current with the current is delivered by the first means and also with a DC current derived from the voltage at the second output from the filter proportional the DC component of the line voltage, the resulting algebraic sum current being applied as a first control current to said output amplifier; and

third means receiving said compensation voltage and supplying a second control current to said output amplifier on each of two connecting wires, said second control current serving to compensate longitudinal currents in the line, each connecting wire having said first control current passing therethrough, and said output amplifier circuit delivering on each line wire a current proportional to the algebraic sum in each of the connection wires of said first and second control currents.

4,540,853
APPARATUS FOR DETECTING A LOOP DURING RINGING

Pierre Albouy, Lannion, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jul. 21, 1983, Ser. No. 516,010
Claims priority, application France, Jul. 30, 1982, 82 13321
Int. Cl.³ H04M 3/04
U.S. Cl. 179—18 FA 6 Claims

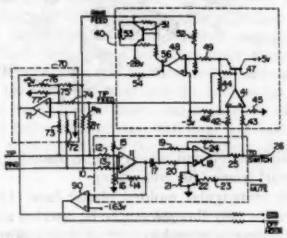


1. Apparatus for detecting a loop during ringing, the apparatus comprising zero pass detector means for detecting zero passes in a voltage signal proportion to the line current and for generating a pulse signal constituted by positive and negative rectangular pulses of equal amplitude and of width dependent on the duty ratio of the line signal, pulse signal processing means responsive to said pulse signal, and storage means for storing a signal delivered by the processing means, the improvement wherein the processing means are constituted by a saturable integrator circuit responsive to said pulse signal for delivering a triangular signal having a positive peak value which increases after ringing has been answered, and a comparator connected to compare the triangular signal with a reference voltage and to deliver a signal to the storage means when a called subscriber answers.

4,540,854
SUBSCRIBER LINE INTERFACE CIRCUIT

Patrick R. Beirne, Kanata, Canada, assignor to Mitel Corporation, Kanata, Canada

Filed Jul. 28, 1983, Ser. No. 518,191
Claims priority, application Canada, Dec. 17, 1982, 418003
Int. Cl.³ H04Q 3/00
U.S. Cl. 179—18 FA 9 Claims



1. A telephone line circuit for connection between a balanced two-terminal port and an unbalanced terminal comprising:

(a) first differential amplifier means for receiving incoming signals from said balanced two-terminal port and converting them to unbalanced signals;

(b) circuit means for applying said unbalanced signals to said unbalanced terminal;

(c) second differential amplifier means having a pair of differential input terminals coupled across said circuit means for receiving signals originating from said unbalanced terminal, and a pair of balanced output terminals for driving said balanced two-terminal port with a pair of balanced outgoing signals representative of said signals received from the unbalanced terminal;

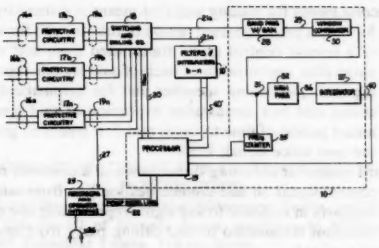
(d) means for detecting an imbalance in dc-current flowing into and out of said balanced two-terminal port, and indicating grounding of either side of said balanced two terminal port in response thereto; and

(e) means for limiting said dc-current to a predetermined value in response to detection of said imbalance.

4,540,855
DETECTING SIGNALS WITHIN A PASSBAND ON A TELEPHONE LINE

Aleksander Szlam, Marietta, and Chester P. Quinn, Chamblee, both of Ga., assignors to Melita Electronic Labs, Inc., Atlanta, Ga.

Division of Ser. No. 415,711, Sep. 7, 1982, Pat. No. 4,477,698.
This application May 14, 1984, Ser. No. 609,925
Int. Cl.³ H04M 1/00
U.S. Cl. 179—84 R 6 Claims



1. Apparatus for providing a digital output signal characterized by being in a first state or a second state, in response to signals on a telephone line comprising in combination:

a band pass filter characterized by a predetermined passband connected to said telephone line for providing a filter output signal on a filter output in response to the presence of said signals on said telephone line within said predetermined passband;

comparator means connected to said filter output for providing a comparator output signal in a first output state in response to said filter output signal being of at least a predetermined threshold level and alternately for providing said filter output signal in a second output state in response to said output signal being less than said predetermined threshold level; and

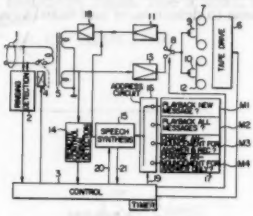
integrating filter means connected to said comparator means for providing said digital output signal and for causing said digital output signal to be in said first state only in response to said comparator output signal making a plurality of transitions from said second output state to said first output state within a second predetermined period of time, each of said plurality of transitions being separated in time from the next one of said transitions by a time period less than a first predetermined period of time, said second predetermined period of time being greater than said first predetermined period of time.

4,540,856

REMOTE CONTROL SYSTEM

Teruo Fujii; Hiroshi Fukushima, and Nobuo Nakai, all of Toyokawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,241
Claims priority, application Japan, May 31, 1982, 57-91252
Int. Cl.³ H04M *1/64*
U.S. Cl. 179—89 **9 Claims**



1. A remote control system for effecting selective execution by remote control of any one of a plurality of functions of an apparatus connected to a communication line of the type permitting bidirectional communications comprising:

first means for sequentially generating a plurality of voice signals representing questioning speeches each relating to respective ones of said functions of said apparatus and for transmitting said signals to a calling party over said communication line;

second means for placing said first means in a stand-by-state for only a predetermined period of time to wait for arrival of a remote control signal transmitted from said calling party after transmission of each of said signals representing said questioning speeches and for automatically enabling said first means after expiration of said predetermined period of time to cause said first means to generate the next voice signal;

third means for detecting transmission of a common remote control signal on said communication line from said calling party in response to any signal representing one of said functions transmitted to said calling party from said first means; and

fourth means for executing said one function when said remote control signal responding to said signal representing said one function is detected by said third means.

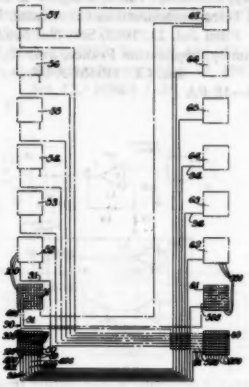
4,540,857

CIRCUIT TESTING OF TELEPHONE GRIDS OR THE LIKE

Donald F. Parsons; Gerald J. Parsons; Brian D. Greenwald, all of West Chester, and Elizabeth A. Parsons, Ambler, all of Pa., assignors to Communications Test Design, Inc., W. Chester, Pa.

Continuation-in-part of Ser. No. 341,708, Jan. 22, 1982, abandoned. This application Aug. 4, 1983, Ser. No. 520,194
Int. Cl.³ H04M *3/28*
U.S. Cl. 179—175.21 **22 Claims**

1. A method of testing a telephone switching grid having a multiplicity of incoming telephone connectors, a multiplicity of outgoing telephone connectors, and switch selector means connected to establish individual interconnections between individual incoming connectors and individual outgoing connectors, in which method the switch selector means is actuated to establish in rapid sequence individual interconnections for all the incoming or outgoing connectors, grounding one end of all but one of the connectors, applying a signal to said one



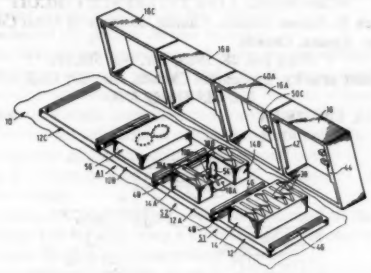
ungrounded connector end, and detecting the presence or absence of signal on both ends of all connectors.

4,540,858

MODULAR SWITCH UNIT WITH SNAP-IN BASE, SEPARATE MODULAR SWITCH UNIT AND COVER CODED SWITCH ACTUATING INTERIOR LUGS

Franz-Josef Knoop, Bueren-Steinhausen, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Aug. 15, 1983, Ser. No. 523,084
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1982, 3230412
Int. Cl.³ H01H *23/04*
U.S. Cl. 200—5 R **11 Claims**



1. A modular switch unit which can be placed into an opening in a support frame (10) comprising:

a generally rectangular molded plastic base (12) having a body portion (60) dimensioned to be inserted and received in close fitting relationship with at least a portion of said frame opening and a shoulder portion (20) which limits the extent of insertion;

a plurality of pin-plug electrical receptacles (18) disposed in two parallel rows in said base (12) and having upwardly extending female ends and downwardly extending male ends, the male ends extending beyond said body portion and the female ends being substantially flush with an upper support surface of said base;

at least one switch module having at least a pair of male contacts (28) extending from one surface thereof and a rocker (30) on an opposite surface thereof for opening and closing an electrical circuit between said contacts (28);

said switch module being disposed on the base with said contacts (28) received in and frictionally held by the female ends of at least some of said receptacles (18);

and a cover (16) removably disposed on said base in surrounding relationship to said module, said cover carrying on the interior surface thereof at least one switch rocker actuating element (50) in a predetermined position to actuate said rocker (30) to a predetermined condition.

4,540,859

CONVERTIBLE NORMALLY CLOSED/NORMALLY OPEN SWITCH WITH CAM ACTUATOR

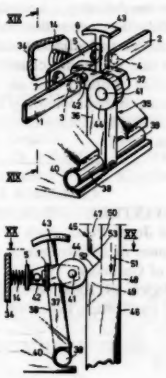
Helmut Lemmer, Marienheide, Fed. Rep. of Germany, assignor to Starkstrom Gummersbach GmbH, Marienheide, Fed. Rep. of Germany

Division of Ser. No. 515,020, Jul. 18, 1983,. This application Aug. 27, 1984, Ser. No. 644,778

Claims priority, application 07161982, Jul. 16, 1982, 82106410.2

Int. Cl.³ H01H *9/00, 15/00*

U.S. Cl. 200—6 B **6 Claims**



1. An electric switching device having a contact system including a movable contact bridge and two stationary contact bars cooperating with the bridge to close or open an electric circuit, comprising means for converting the device into a circuit breaker or a circuit maker, said converting means including a swingable arm which at one side thereof engages said contact bridge and at the other side is provided with a cam follower, a shiftable cam track member engaging the cam follower, means for guiding said cam track member along a straight path between a rest position and an activated position to displace via said swingable arm the contact bridge relative to said stationary contact bars, and means for adjusting the engagement between said cam follower and said cam track member so as to establish in the rest position of the latter, an open or closed switching condition of the device.

4,540,860

PRESSURE RESPONSIVE SWITCH

Takeshi Odashima, and Tsutomu Saito, both of Tokyo, Japan, assignors to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Filed Apr. 15, 1983, Ser. No. 485,519

Claims priority, application Japan, Oct. 5, 1982, 57-173901; Dec. 27, 1982, 57-226600; Feb. 10, 1983, 58-019589

Int. Cl.³ H01H *35/32*

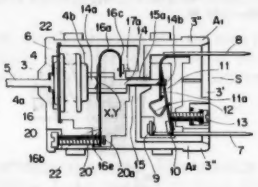
U.S. Cl. 200—83 C **8 Claims**

1. A pressure responsive switch comprising:

a casing having a first inner end and a second inner end; a bellows provided within said casing at said first inner end having an opening to receive air pressure changes from outside the casing for expansion of said bellows within the casing;

a switch section provided within the casing at said second inner end;

an actuating rod longitudinally extending in an axial direction of said expansion of the bellows between said bellows and said switch section, and having a first end axially



aligned with and substantially opposite said bellows and a second end to operate the switch section; and

resilient means through which said rod extends for resiliently counteracting said expansion of the bellows to exert balanced force on the actuating rod in cooperation therewith, and means actuated by said actuating rod to cause operation of a switch in said switch section.

4,540,861

CONTACT MATERIAL FOR VACUUM CIRCUIT INTERRUPTER

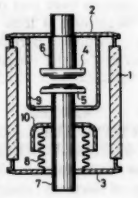
Mitsuhiro Okumura; Eizo Naya; Mitsumasa Yorita, and Yasushi Takeya, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,359

Claims priority, application Japan, May 18, 1983, 58-88428

Int. Cl.³ H01H *33/66*

U.S. Cl. 200—144 B **6 Claims**



1. A contact material for a vacuum circuit interrupter, comprising: a first component material of copper, a second component material of tantalum and a third component material selected from a group consisting of cobalt, iron, or a mixture of cobalt and iron, said third component material being present in an amount of not more than 50 wt%, and a combination of said second and third component materials being present in an amount of no less than 10 wt%, said third component material being present in an amount sufficient to react with said second component material, whereby interrupting and breakdown performance of the vacuum circuit interrupter are improved.

4,540,862

VACUUM SWITCH WITH AN INSULATING STRUT

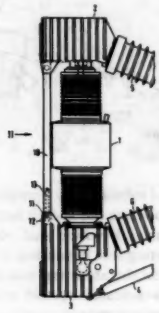
Siegfried Jahrig, and Wolfgang Opitz, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

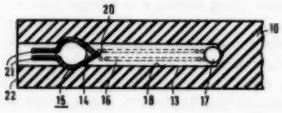
Filed Apr. 26, 1983, Ser. No. 488,762

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1982, 8212580[U]

Int. Cl.³ H01H *33/66;* **H01B** *17/42*

U.S. Cl. 200—144 B **7 Claims**





1. In a vacuum switch including an electrically conducting head piece held by a support insulator; a base held by a further support insulator; a switching tube arranged between the head piece and the base; and at least one insulating strut which connects the head piece and the base, said strut having, at each end, a transverse hole for receiving fastening means, the improvement comprising:

(a) at at least one end of the insulating strut, a longitudinal hole which has one end open at said end of said strut, goes through the transverse hole, and extends over part of the total length of the insulating strut, terminating in a closed end; and

(b) an electrically conducting part disposed in said longitudinal hole which extends over part of the total length of the insulating strut beginning at least at the transverse hole, said electrically conducting part being rounded at its end facing the closed end of the longitudinal hole.

4,540,863

VACUUM-SWITCHING TUBE, ESPECIALLY FOR A LOW-VOLTAGE CONTACTOR

Hans Bettge; Günther Bialkowski, and Ernst-Ludwig Hoene, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

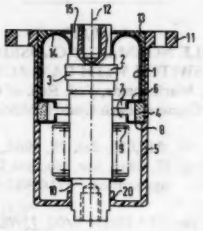
Filed Jul. 27, 1984, Ser. No. 634,983

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327390

Int. Cl.³ H01N *33/66*

U.S. Cl. 200—144 B **12 Claims**

1. Vacuum-switching tube for a vacuum switch having two poles and producing metal vapor during switching, comprising a housing including a metal vessel partially defining a switching chamber and at least one high temperature-resistant insulator disposed axially of said metal vessel outside said switching chamber, said insulator having a side facing away from said switching chamber and said insulator having a relatively small axial height being at least sufficient for insulating the two poles of the vacuum switch at given voltages expected in the vacuum-switching tube during operation, a fixed and a movable coaxial switching contact disposed in said switching chamber, a shaft connected to said movable contact for moving said movable contact in axial direction, a device for shielding said insulator from the metal vapor produced during switching,



said shielding device defining a boundary of said switching chamber in axial direction, accordion bellows disposed outside said switching chamber and adjacent said side of said insulator facing away from said switching chamber for vacuum-tightly sealing said movable contact, and an insulating cap resting against said insulator and surrounding said insulator and said accordion bellows, said insulating cap including a guide bearing for guiding said shaft.

4,540,864

ACTUATING FIXTURE FOR PUSH-PULL SWITCH

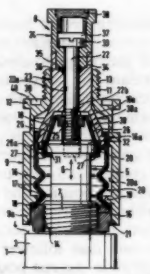
Fritz Krasser, and Josef Peter, both of Altdorf, Fed. Rep. of Germany, assignors to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed Oct. 18, 1983, Ser. No. 543,515

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241677

Int. Cl.³ H01H *13/06*

U.S. Cl. 200—302.2 **10 Claims**



1. An actuating fixture for a push-pull switch, in particular for a protective circuit breaker for on-board power supply means, which switch comprises a switch casing having a frontal face, an actuating head protruding from said frontal face, an externally threaded annular flange of said casing extending axially outwardly therefrom and serving the mounting said switch on a switchboard or the like panel; and which actuating fixture comprises

(a) a push-pull button having an inner guiding end part facing toward said switch casing;

(b) clamping tong means adapted for clamping connection with said actuating head;

(c) a protective housing, in which said push-pull button is axially displaceably lodged, said protective housing hav-

ing an inwardly facing end portion, turned toward said switch, and surrounding said inward button end part;

(d) said protective housing comprising a collar portion, from which said push-pull button protrudes outwardly, and said inwardly facing end portion of said protective housing bearing an internal threading adapted for being threaded on to said externally threaded flange of said switch casing;

(e) an encasing hose of water-tight flexible material which hose connects said inner guiding end part of said push-pull button with the inwardly facing end portion of said protective housing in a water-tight manner, said encasing hose surrounding an internal space for housing the actuating head;

(f) said collar portion of said protective housing having an external threading, the type and diameter of which are the same as those of the internal threading of the inward end portion of said protective housing; and

(g) said encasing hose having a first open end thereof turned toward said switch, said protective housing having an inner wall surface and comprising an annular rib projecting radially inwardly from said inner housing wall, and an internally threaded annular nut sealingly set in said protective housing so as to constitute said inwardly facing end portion, said first encasing hose end being clamped in between said rib and said nut.

4,540,865

PUSH BUTTONS

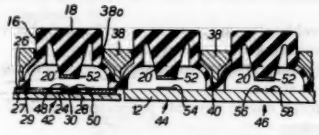
John Calder, Woodthorpe, England, assignor to Plessey Overseas Limited, Ilford, England

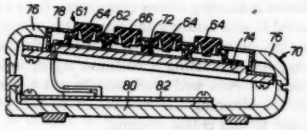
Filed Feb. 29, 1984, Ser. No. 584,626

Claims priority, application United Kingdom, Mar. 1, 1983, 8305647; Aug. 23, 1983, 8322649

Int. Cl.³ H01H *13/52, 13/06*

U.S. Cl. 200—340 **7 Claims**





5. An assembly of push buttons which extends in two dimensions in the form of a keyboard, comprising:

a moulded resilient mat;

a guide plate with a plurality of openings therein; and

a base plate having a plurality of sets of electrical contacts;

said moulded resilient mat having a plurality of moulded structures each comprising a two-part sidewall which includes an arcuate deformable part of substantially quarter-circle configuration in cross-section, and a substantially rigid guide part;

each of said moulded structures also including an outer cover portion and a tapering projection facing inward from said cover portion, and said moulded resilient mat also having an area of flat resilient material between each moulded structure;

said sidewall arcuate deformable part of each moulded structure having opposite ends integral with and perpendicular to said flat resilient material and said sidewall rigid guide part, respectively, said rigid guide part also being integral with and perpendicular to said cover portion, and said projection being integral with said cover portion and tapering from substantially the entire internal surface of said cover portion to provide a reduced inner surface adjacent said base plate;

said rigid guide portions of said moulded structures projecting through respective ones of the openings in said guide plate and said tapered projection being located over respective sets of said electrical contacts on said base plate; and

said guide plate, moulded resilient mat and base plate forming a sandwich with said guide plate at the top, said moulded resilient mat in the middle and said base plate at the bottom.

4,540,866

INDUCTION HEATING APPARATUS

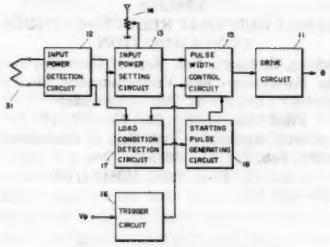
Takao Okuda, Ohtsu, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Nov. 29, 1983, Ser. No. 556,110

Claims priority, application Japan, Dec. 3, 1982, 57-213170

Int. Cl.³ H05B *6/64, 1/02*

U.S. Cl. 219—10.77 **6 Claims**



1. An induction heating apparatus comprising:

an inverter circuit including a resonance circuit comprising an induction heating coil and a resonance capacitor, and a switching element for energizing said resonance circuit,

an input power setting circuit which sets an input power to a load,

a pulse width control circuit which generates a pulse signal to control the time period in which said switching element is to be on, on the basis of an output of said input power setting circuit,

an input power detection circuit for detecting an input current for the load, and

a load condition detection circuit which compares said pulse signal directly with the output of said input power detection circuit,

whereby the results of comparison by said load condition detection circuit are used to discriminate between normality and abnormality of the load and when an abnormal load is detected, oscillation of said inverter circuit is inhibited.

4,540,867

LINEARIZED SCANNING SYSTEM AND METHOD FOR AN ENERGY BEAM

Charles B. Ackerman, Paradise Valley, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

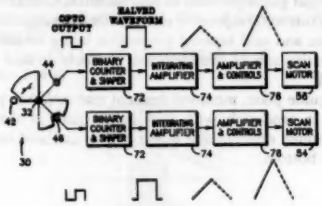
Filed Jun. 25, 1984, Ser. No. 623,890

Int. Cl.³ B23K *26/00*

U.S. Cl. 219—121 LW **17 Claims**

1. A scanning system for linearized application of an energy beam along at least one of a plurality of predetermined axes comprising:

chopper means intercepting said energy beam for alternately reflecting and passing said energy beam and providing successive reflected and passed beams respectively therefrom; and



first and second scanning means for receiving said reflected and passed beams respectively, said first and second scanning means synchronously directing said reflected and passed beams along at least one of said predetermined axes.

4,540,868

PLASMA GUN THAT REDUCES CATHODE CONTAMINATION

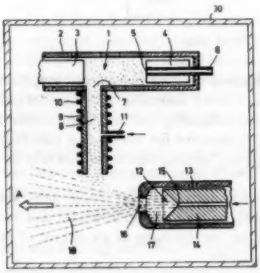
Lothar Liebing, Stuttgart, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,694

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208085; Feb. 3, 1983, 3303677

Int. Cl.³ B23K *9/00*; H05H *1/00*

U.S. Cl. 219—121 PM **12 Claims**



1. A plasma gun comprising

an evacuatable vessel,

wall means defining a cathode cavity,

a cathode and an anode arranged in said evacuatable vessel to produce a connecting plasma and a bombarding plasma jet with said cathode being located in said cathode cavity, said cathode eroding during operating and producing particles of cathode material in said connecting plasma,

a cooled duct having an inlet port and an outlet port and connected to said cathode cavity at said inlet port, said cathode being arranged in said cathode cavity such that it is laterally offset relative to the inlet port of the cooled duct, and said cooled duct defining the orientation of said connecting plasma,

a first supply line for a gas stream connected through said anode to form said bombarding plasma jet downstream of said anode, said anode being laterally offset relative to the outlet port of said cooled duct such that a gas discharge duct for said bombarding plasma jet is formed at an angle of approximately 90° with respect to said cooled duct, and

a second gas supply line that opens into said cooled duct between said inlet port and the outlet port of said cooled duct adjacent said bombarding plasma jet, gas being supplied through said second gas supply line as a substitute for a portion of said cathode material deposited on said cooled duct in order to maintain a substantially constant particle density in said connecting plasma formed between said cathode and said bombarding plasma jet.

4,540,869

WELDING TORCH

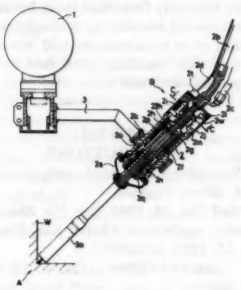
Hirotoshi Yasuoka, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1983, Ser. No. 469,655

Claims priority, application Japan, Feb. 26, 1982, 57-30408; Jul. 14, 1982, 57-122616

Int. Cl.³ B23K *9/12*

U.S. Cl. 219—124.34 **21 Claims**



1. A welding torch for use in a welding robot having a robot arm, comprising:

(a) a housing adapted to be supported at a distal end of the robot arm;

(b) a torch nozzle movably supported at a distal end of said housing;

(c) switch shaft means movably supported in said housing and axially movable in response to the movement of said torch nozzle; and

(d) collision indicating means comprising limit switch means mounted in said housing and actuatable in response to the retraction of said switch shaft means further into said housing for generating a collision signal indicative of a collision between said torch nozzle and a workpiece and means for stopping the movement of the robot arm in response to said collision signal.

4,540,870

MACHINE FOR ELECTRIC ARC WELDING AND AIR CARBON ARC GOUGING ON VERTICAL CURVED OR STRAIGHT WALLS

William A. Kaufmann, West Allis, Wis., assignor to Teledyne Industries, Inc., York, Pa.

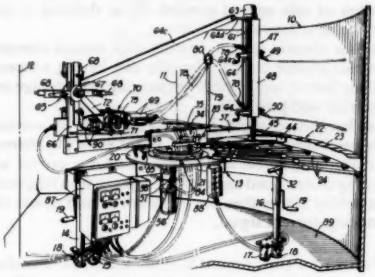
Filed Jun. 4, 1984, Ser. No. 616,805

Int. Cl.³ B23K *9/12*

U.S. Cl. 219—126 **20 Claims**

1. A machine for reconditioning substantially vertical walls by gouging and/or welding operations comprising a table assembly adapted to be positioned and releasably locked in a use position relative to a substantially vertical wall, a substantially horizontal carriage arm assembly secured to the table assembly and being rotatable relative to the table assembly on a substantially vertical axis of rotation, rotational power means connected between the table assembly and carriage arm assembly, an upright weld metal depositing and/or gouging assembly mounted on and being bodily carried by the carriage arm

assembly, means forming a vertical axis rotational connection between the carriage arm assembly and said upright weld metal depositing and/or gouging assembly, substantially horizontally projecting guide means on said last-named means and adapted to follow the horizontal profile of a substantially vertical wall undergoing reconditioning by the machine and to



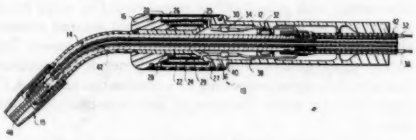
impart vertical axis rotation to said upright weld metal depositing and/or gouging assembly to maintain the latter in correct alignment with said wall, and yielding power means connected with the carriage arm assembly and biasing it in a linear horizontal direction to maintain said guide means in engagement with a surface to be followed by the guide means during operation of the machine.

4,540,871

WELDING GUN WITH MULTI-DIRECTIONAL SWITCH

Don J. Corrigall; Floyd D. Hansen, and James R. Kujawa, all of Appleton, Wis., assignors to Miller Electric Manufacturing Company, Appleton, Wis.

Filed Jun. 7, 1983, Ser. No. 502,055
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—137.63 **8 Claims**



1. In a welding gun having an elongated tubular rigid handle including a switch means for electrically completing an electrical circuit to initiate a welding process, the improvement wherein said switch means comprises:

a flexible electrically insulating tubular wall completely surrounding a portion of said rigid handle in a circumferential opening thereof and also surrounding a corresponding portion of the longitudinal axis of the handle, said wall being manually depressible at all points around the circumference thereof inwardly toward the longitudinal axis of the handle;

electrically conducting outer tubular spring means mounted in the handle interiorly of, and adjacent to, said flexible wall and depressible inwardly when engaged by said wall; and

electrically conducting inner tubular spring means mounted in the handle interiorly of said outer spring means and adapted to be contacted by the depressed outer spring means to complete an electrical circuit to initiate a welding process;

wherein said outer spring means is an elongated tubular coil spring having a longitudinal axis corresponding to that of said flexible wall;

wherein said inner spring means is an elongated tubular coil spring having a longitudinal axis corresponding to that of said flexible wall; and

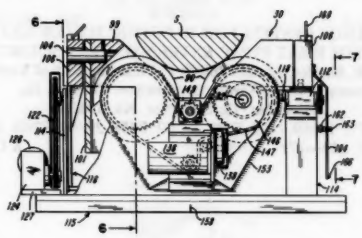
wherein said wall, said outer spring means and said inner spring means are cylindrical and coaxial.

4,540,872

APPARATUS FOR ROTATING A GENERALLY CYLINDRICAL HEAVY WORKPIECE FOR TREATMENT

G. Daniel Siler, Dayton, Ohio, assignor to Dayton Machine Tool Company, Dayton, Ohio

Filed Feb. 6, 1984, Ser. No. 577,351
Int. Cl.³ B23K *9/225*
U.S. Cl. 219—159 **20 Claims**



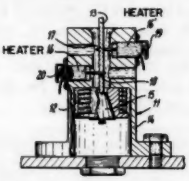
1. Apparatus for rotatably supporting an elongated generally cylindrical workpiece having substantial weight, said apparatus comprising a pair of parallel spaced cradle rolls defining a nest for receiving and supporting the workpiece, a frame receiving said rolls, means mounted on said frame and supporting said rolls for rotation on their axes, a set of frame support members spaced with said frame therebetween, shaft means supported by said support members and supporting said frame and said cradle rolls for pivotal movement as a unit on an axis extending transversely to the axes of said rolls, a base member adapted to rest on a floor surface, a plurality of jacks mounted on said base member and supporting said frame support members, means for operating said jacks for raising or lowering said frame support members to position the workpiece at a precise elevation with said cradle rolls, and said base member and said jacks being spaced from said frame to provide for tilting movement of said unit including said frame and said cradle rolls.

4,540,873

SYSTEM FOR BREAKING A TENSIONED CONNECTING ELEMENT

Gerardus J. A. N. Kester, Delft, Netherlands, assignor to Fokker B.V., Schiphol, Netherlands

Filed Mar. 2, 1984, Ser. No. 585,890
Claims priority, application Netherlands, Mar. 3, 1983, 8300788
Int. Cl.³ H05B *1/00*; B26F *3/12*
U.S. Cl. 219—200 **8 Claims**



1. A system for releasing parts of a space craft construction,

which parts are maintained in a predetermined position within the construction, said system comprising:

(a) a tensioned cable element, made of a material that will degrade under influence of heat, stretched between two supporting elements of the construction thereby maintaining said parts into said predetermined position, and

(b) at least one electrical heating element connectable to an electrical power source and mounted into a frame attached to a space craft structure, such that said heating element and an opposed cable section are pressed towards each other,

the tension in said cable being sufficient to displace ruptured end parts of the cable, after its breakage, out of contact with said heating element.

4,540,874

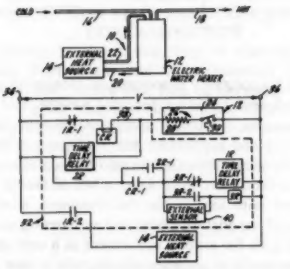
CONTROL SYSTEM FOR ELECTRIC WATER HEATER WITH HEAT PUMP EXTERNAL HEAT SOURCE

Jacob E. Shaffer, Jr., and Joseph F. Picarello, both of York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 18, 1984, Ser. No. 570,338

Int. Cl.³ H05B *1/02;* **F28F** *27/00;* **F25B** *29/00;* **F24H** *1/00*

U.S. Cl. 219—279 **8 Claims**



1. A control system for a water heater operatively associated with an external heat source, said water heater including a water storage tank and an electric tank heating unit, said tank heating unit having at least one tank thermostat responsive to water temperature in said tank, said tank thermostat closing when there is a demand for hot water in said tank thereby allowing a current to flow through said tank heating unit so as to turn it on and opening when the demand has been satisfied thereby interrupting the current flow through said tank heating unit so as to turn it off, said control system comprising means responsive to an initial current surge through said tank heating unit when said tank thermostat closes both for interrupting the current flow so as to maintain said tank heating unit off and for turning said external heat source on, the initial current surge cleaning the contacts of said tank thermostat by burning off any residue thereon.

4,540,875

ELECTRIC STORAGE HEATER SYSTEM HAVING CHARGING CONTROL THAT TRANSMITS CHARGING INFORMATION OVER POWER LINES

John L. Buttolph, III, Essex Junction, Vt., assignor to Silver Lake Corporation, Essex Junction, Vt.

Continuation of Ser. No. 374,900, May 4, 1982, abandoned. This application Jul. 27, 1984, Ser. No. 635,305

Int. Cl.³ H05B *1/02*

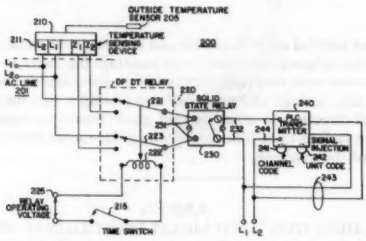
U.S. Cl. 219—364 **8 Claims**

1. An electric storage heating system comprising,

charge control circuitry for generating two control signals including a first control signal, said first control signal being a continuous periodic signal with a first value and a second value and and having a duty cycle related to outside ambient temperature and a second control signal related to electrical power rates on an associated power line, said second control signal having a first value when said electrical power rates on said power line are below a predetermined value, the time duration of said first control signal defining a heater charging time interval, and having a second value when said electrical power rates on said power line are above a predetermined rate, the time duration of said second control signal defining a non-charging time interval,

at least one electric storage heating unit located remotely from said charge control circuitry and having a storage medium therein and means for charging said storage medium from said power line,

a power line carrier signal generator operable for continuously generating an analog A.C. signal using the alternating current signal on said power line for a carrier and encoding thereon said analog A.C. signal with a frequency substantially higher than the frequency of said power line alternating current signal,



a first relay responsive to said first value of said second control signal for applying said first control signal to said power line carrier signal generator to cause said generator to generate a periodic data signal for the entire duration of said heater charging time interval, said periodic data signal consisting of periodic bursts of said analog A.C. signal alternating with periods of no signal, said first relay being responsive to said second value of said second control signal for applying a constant signal to said power line carrier signal generator to cause said generator to produce a steady data signal consisting of a continuous analog A.C. signal for the entire duration of said non-charging time interval,

a power line carrier signal receiver located at said one remote storage heating unit location, said receiver being connected to said power line and being responsive to said data signal on said power line for decoding said signal to produce an operating voltage, and

a second relay responsive to said operating voltage for controlling the charging of said heating unit.

4,540,876

FURNACE SUITABLE FOR HEAT-TREATING SEMICONDUCTOR BODIES

Gordon K. McGinty, Surrey, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1984, Ser. No. 585,318

Claims priority, application United Kingdom, Mar. 18, 1983, 8307588

Int. Cl.³ F27B *5/14;* **F27D** *11/00*

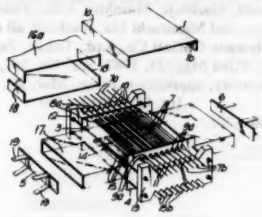
U.S. Cl. 219—405 **18 Claims**

1. A furnace comprising

a rectangular chamber receiving a body to be heated, said chamber being defined by six plane reflecting walls completely closing said chamber in use, and

at least one first plurality of elongated heat radiation lamps extending between first and second opposite walls of said chamber, said lamps being mutually parallel, said lamps

being equally spaced apart, and said lamps lying in a plane parallel to third and fourth opposite walls of said chamber,



wherein outermost lamps of said plurality are separated from fifth and sixth opposite walls respectively by a distance less than one and one half times a spacing between adjacent lamps.

4,540,877

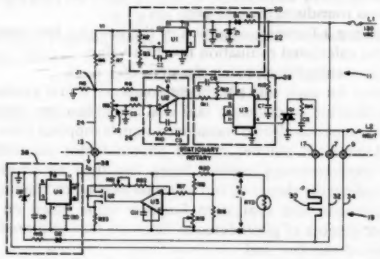
CONSTANT CURRENT CLOSED LOOP CONTROLLER FOR ROTATING SYSTEM

Richard J. Zelinka, Circle Pines; George K. Sutherland, White Bear Lake, and Thomas J. Thielen, Minneapolis, all of Minn., assignors to Sys-Tec, Inc., Minneapolis, Minn.

Continuation of Ser. No. 354,654, Mar. 4, 1982, abandoned. This application Dec. 21, 1983, Ser. No. 564,032

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—497 **4 Claims**



1. A closed loop controller for a rotatable heating system comprising:

(a) a rotatable member having at least one heating element mounted thereto;

(b) means rotating with said rotatable member for sensing the temperature of said heating element and including means for differentially producing a magnitude varying current control signal of at least a minimum magnitude and proportional to the sensed temperature and further including means for establishing a range within which the current control signal might vary relative to temperature changes of said heating element;

(c) stationary means remote from said rotatable member for comparing said current control signal to a set-point control signal of a selectable magnitude corresponding to a desired temperature at said heating element and including means for producing a third control signal so long as an inequality exists;

(d) switch means responsive to said third control signal for applying power to said heating element; and

(e) first slip ring means for coupling said current control signal to said stationary means and second slip ring means for coupling said power to said heating element; and wherein

(f) the minimum magnitude of said current control signal is set relative to said set-point control signal and said first slip ring means so as not to be affected by noise at said first slip ring means.

4,540,878

NET CIRCUIT TYPE HEATING AND WARMING EQUIPMENT

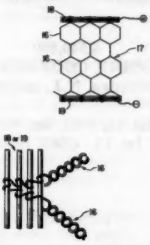
Ryoda Sato, 8-25 Obamacho 1-chome, Amagasaki-shi Hyogo-ken, Japan

Filed Feb. 23, 1984, Ser. No. 583,060

Claims priority, application Japan, Jun. 2, 1983, 58-96971

Int. Cl.³ H05B *3/34*

U.S. Cl. 219—545 **6 Claims**



1. A net type heating device, comprising:

first and second spaced common power source terminals, each of said terminals comprising a plurality of adjacent bendable wires; and

a plurality of heater cords formed in a mesh-like arrangement disposed between said first and seond common power source terminals,

said mesh-like arrangeament having a multiplicity of nodes a plurality of said heater cords meeting at each node, said nodes being in electrical contact with each other and with both of said common power source terminals,

each of said heater cords comprising a heat-resistant nonconductive fiber and a bendable electrically conductive heating wire interwound with said nonconductive fiber,

the heating wires of the heater cords meeting at each node being electrically connected to each other at the node where they meet,

the heating wires of the heate cords adjacent each of said first and second common power source terminals being wound around each individual ones of the adjacent bendable wires of the corresponding one of said terminals, to electrically and mechanically secure said heater cords to said terminals.

4,540,879

ALIGNMENT TOOLING FOR METAL CYLINDER WELDING MACHINES

William W. Haerther, Geneva, and T. Jayes Hartz, Downers Grove, both of Ill., assignors to Ideal Carbide Die Co., Chicago Ridge, Ill.

Filed Jun. 9, 1983, Ser. No. 502,501

Int. Cl.³ B23K *11/06*

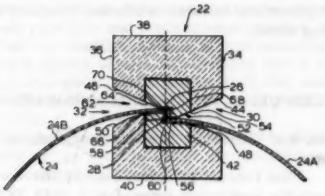
U.S. Cl. 219—61.3 **11 Claims**

6. An alignment tool for a can welding machine comprising:

a two part integrated tool unit comprising:

a first body part made of a cemented tungsten carbide material having high tensile strength and a high hardness value and in which is formed a Z-shaped recess configuration adapted to register the edges of a can blank in overlapping welding alignment,

and a second cap part means made of a ceramic electrically insulating material for connecting and mounting



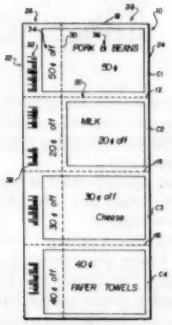
said first body part on the can welding machine in electrically insulated relationship therewith.

4,540,880

UNIVERSAL PRODUCT CODE SCANNABLE COUPON

George P. Hipko, Milltown, N.J., assignor to Beatrice Foods, Co., Chicago, Ill.

Filed Jul. 11, 1983, Ser. No. 512,658
Int. Cl.[3] G06K *19/00*
U.S. Cl. 235—487 12 Claims



1. A consumer attachable pre-oriented scannable coupon for use in combination with an article and an optical scanning system, comprising:

a. a generally planar member having front and rear surfaces;

b. said member including a stub portion and a dealer redemption return portion;

c. force responsive separation means disposed between said stub portion and said dealer redemption return portion;

d. said stub portion rear surface having adhesive means generally adjacent said separation means for securing said stub portion to said article and for permitting ease in separation of said dealer redemption return portion from said stub portion when said stub portion is secured to an article;

e. said stub portion front surface having optically scannable indicia means thereon for being scanned by said scanner system and for transmitting data thereto;

f. said stub portion front surface having premium information printed thereon spaced from said optically scannable indicia means;

g. said dealer redemption return portion front surface having printed information thereon; and,

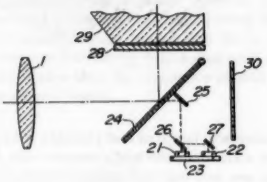
h. said dealer redemption return portion being separatable from said stub portion generally subsequent to said optically scannable indicia means being scanned by said scanner system and whereby said adhesive means secures said stub portion to said article while sufficient force is applied to said dealer redemption return portion for causing separation of said dealer redemption return portion from said stub portion.

4,540,881

METHOD OF DETECTING FOCUSING CONDITIONS

Asao Hayashi, Hachioji; Masahiro Aoki, Fussa; Kenichi Oinoue, Tokyo, and Masatoshi Ida, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,435
Claims priority, application Japan, Mar. 27, 1981, 56-44183
Int. Cl.[3] G01J *1/20*
U.S. Cl. 250—201 9 Claims



1. A method of detecting focusing conditions comprising the steps of:

providing at least one photodetector array including K photo-electric transducer elements arranged at or near a focusing plane for an imaging lens and/or a plane optically conjugated with the focusing plane;

projecting a subject image onto the photo-electro transducer elements through the imaging lens, thereby generating photo-electro transduced signals;

calculating an evaluation function value representing the contrast or sharpness of the subject image from the photo-electro transducer signals; and

determining a focusing condition of the imaging lens based on the calculated evaluation function value;

the improvement comprising the steps of:

providing for each said photodetector array a first evaluation function to calculate said evaluation function value based on photo-electro transduced signals supplied from a predetermined number of said photodetector elements, said predetermined number being less than all of said photodetector elements, and a second evaluation function to calculate said evaluation function value based on a larger number of photodetector elements than said predetermined number; and

determining said focusing condition using said first evaluation function or said second evaluation function, said determination being performed by said second evaluation function when said evaluation function value obtained using said first evaluation function is less than a predetermined threshold value, and using said first evaluation function otherwise.

4,540,882

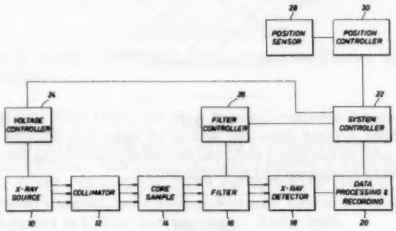
METHOD OF DETERMINING DRILLING FLUID INVASION

Harold J. Vinegar, and Scott L. Wellington, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1983, Ser. No. 566,441
Int. Cl.[3] G01V *5/00*
U.S. Cl. 250—255 25 Claims

8. A method of determining the invasion of drilling fluid into a core sample from a borehole, said method comprising the steps of: adding a first material havng a K-edge at a first energy to the drilling fluid; collecting a preserved sample from said borehole; scanning said core sample with a computerized axial tomographic scanner (CAT) at a second mean energy that is

less than said first energy to determine the attenuation coefficients at a plurality of points in a cross section of said core sample at said second energy; scanning said core sample with a CAT at a third mean energy that is greater than said first energy to determine the attenuation coefficients at said plurality of points in said cross section at said third energy; using the



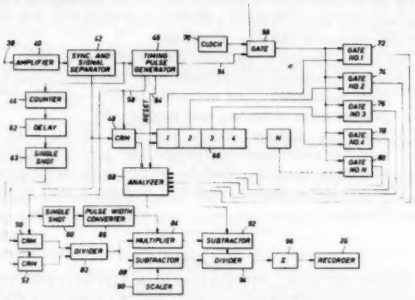
attenuation coefficients determined for said core sample at said second and third energies to determine a concentration map of said first material in said cross section; determining from said concentration map the depth of invasion into said core sample of said first material as an indication of the depth of invasion of said drilling fluid.

4,540,883

BACKGROUND CORRECTION METHOD AND APPARATUS FOR PULSED NEUTRON LOGGING OF EARTH BOREHOLES

Russel R. Randall, Katy, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 13, 1982, Ser. No. 417,270
Int. Cl.³ G01V 5/10
U.S. Cl. 250—262 **20 Claims**



1. A method for determining characteristics of earth formations surrounding a borehole, comprising the steps of:

irradiating said earth formations with bursts of high energy neutrons;

detecting radiations emanating from said irradiated formations;

generating time-sequenced electrical pulses indicative of said detected radiations;

generating an electrical signal functionally related to a time distribution of said time-sequenced elecrtrical pulses; and

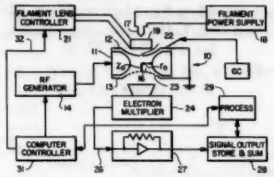
correcting said time distribution signal to compensate for background radiation.

4,540,884

METHOD OF MASS ANALYZING A SAMPLE BY USE OF A QUADRUPOLE ION TRAP

George C. Stafford; Paul E. Kelley, and David R. Stephens, all of San Jose, Calif., assignors to Finnigan Corporation, San Jose, Calif.

Filed Dec. 29, 1982, Ser. No. 454,351
Int. Cl.³ B01D 59/44
U.S. Cl. 250—282 **23 Claims**



1. The method of mass analyzing a sample which comprises the steps of

defining a three dimensional quadrupole field in which sample ions over the entire mass range of interest can be simultaneously trapped

introducing or creating sample ions into the quadrupole field whereby ions within the range of interest are simultaneously trapped

changing the three dimensional trapping field so that the simultaneously trapped ions of consecutive specific masses become sequentially unstable and leave the trapping field and

detecting the sequential unstable ions as they leave the trapping field and

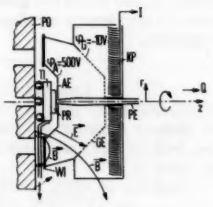
providing an output signal indicative of the ion mass.

4,540,885

SPECTROMETER OBJECTIVE HAVING PARALLEL OBJECTIVE FIELDS AND SPECTROMETER FIELDS FOR THE POTENTIAL MEASURING TECHNIQUE

Erich Plies, Munich; Reinhard Weyl, Assling, and Burkhard Lischke, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,762
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236273
Int. Cl.³ H01J 49/44
U.S. Cl. 250—310 **11 Claims**



1. A potential measuring technique apparatus, comprising:

an objective lens means for focusing primary electrons on an object;

spectrometer secondary electron detection means for energy selection of secondary electrons;

said objective lens means comprising a magnetic lens in which a magnetic field thereof lies primarily outside a body of the lens means;

the spectrometer detection means comprising an electro-

static retarding field spectrometer detection means arranged in the magnetic field of the lens means; and

the magnetic lens and spectrometer detection means being designed such that the magnetic field and an electric field of the spectrometer detection means run substantially in a same direction and with field lines parallel to one another.

4,540,886

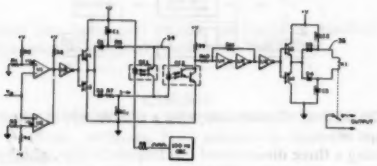
FAIL-SAFE MONITORING SYSTEM

Jack A. Bryant, 500 Main St., Melrose, Mass. 02176

Filed Oct. 7, 1982, Ser. No. 433,224

Int. Cl.³ H05B *33/00*

U.S. Cl. 250—554 **3 Claims**



1. A fail-safe system for detecting whether or not a given variable physical condition exists in a given one of a plurality of possible states and for holding an on-off type control in the on state only while said given one state continues, comprising:

(a) means for detecting the existence of said given one state and for generating an oscillating electrical signal only while said given one state continues;

(b) a direct current circuit in the form of a loop;

(c) means responsive to said oscillating signal for generating an uninterrupted direct current flowing around said loop;

(d) an oscillator for generating a second oscillating electrical signal;

(e) means responsive to said oscillator for shunting the flow of current in said loop across a given portion of said loop to cause the flow of current in that portion to be interrupted at the frequency of said oscillator;

(f) means responsive to the flow of current in said portion of said loop for generating a signal having the frequency of said oscillator;

(g) fail-safe means for actuating a control from an "off" to an "on" condition; and

(h) means responsive to the signal generated by the flow of current in said portion of said loop for actuating said control;

whereby, non-existence of said one given state or any failure of any component in any element as defined, leaves said control in the "off" condition.

4,540,887

HIGH CONTRAST RATIO PAPER SENSOR

Timothy M. Minerd, Pittsford, and Robert E. Crumrine, East Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 28, 1983, Ser. No. 461,907

Int. Cl.³ G01N *21/86*

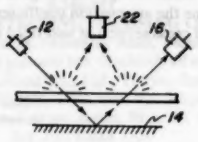
U.S. Cl. 250—561 **6 Claims**

1. Apparatus for determining the presence of paper in a paper path including:

a source of light disposed near the paper path for emitting light in the direction of the paper path,

a reflecting surface,

a first detector disposed near the paper path for detecting a first quantity of light reflected from the reflecting surface when no paper is in the paper path and for detecting a lesser quantity of light reflected from the reflecting surface when paper is in the paper path, the paper in the paper path diffusing a portion of the light emitted by the light source, the improvement comprising:



a second detector disposed near the paper path to detect light emitted from the source of light and diffused by paper in the paper path, the second detector being electrically connected to the first detector.

4,540,888

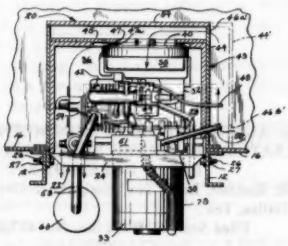
VERTICAL SHAFT ENGINE GENERATOR SET FOR A RECREATIONAL VEHICLE OR THE LIKE

Hugh S. Drewry, Plymouth, and Ewald Keszthelyi, Campbellsport, both of Wis., assignors to Kohler Company, Kohler, Wis.

Filed Sep. 12, 1983, Ser. No. 531,509

Int. Cl.³ B60R *18/00*

U.S. Cl. 290—1 R **12 Claims**



1. A vertical shaft engine generator set installed through a passageway in the floor of a recreational vehicle and mounted to the vehicle or the like comprising:

an engine having a vertically depending drive shaft;

a support member dimensioned to be received through said floor passageway, for mounting to the vehicle said support member mounting said engine; and

a generator disposed below the level of the floor and mounted underneath said engine, said generator having an upwardly extending shaft for mating with said depending engine drive shaft so that said generator shaft is driven thereby.

4,540,889

METHOD AND APPARATUS FOR IMPROVING THE DIELECTRIC STRENGTH OF DIRECT CURRENT CABLE INSULATION

Paolo G. Priaroggia, Milan, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

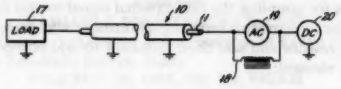
Filed Nov. 9, 1983, Ser. No. 550,248

Int. Cl.³ H02J *3/02*

U.S. Cl. 307—2 **20 Claims**

1. A method for improving the dielectric strength with respect to a direct current voltage of the insulation around a conductor element for forming part of a direct current power transmission system, said insulation being without fluid pressure thereon, said method comprising subjecting said insulation throughout its length to a direct current voltage of a predetermined magnitude applied to said conductor and varying the amplitude of said direct current voltage throughout the length

of said insulation at a periodic rate, said amplitude being varied by an amount less than said predetermined magnitude and less



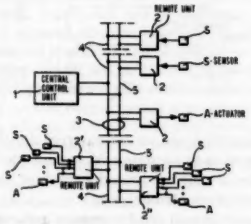
than an amount which will cause voltage breakdown in said insulation.

4,540,890

SYSTEM FOR SELECTIVELY ADDRESSING ELECTRICAL CONTROL SIGNALS FROM A CONTROL UNIT TO A PLURALITY OF REMOTE UNITS

Giovanni Gangemi, and Giuseppe Sefusatti, both of Turin, Italy, assignors to Galber Automazione E, Turin, Italy

Filed Nov. 23, 1983, Ser. No. 554,666
Claims priority, application Italy, May 24, 1982, 87669 A/82
Int. Cl.³ H02J *13/00*; H04Q *9/10*
U.S. Cl. 307—40 **2 Claims**



1. A system comprising

a plurality of remote units connected to a common two-wire transmission line with each unit having at least one controlled device,

a control unit including d.c. voltage supply means connected to said line to feed a constant d.c. supply voltage to the remote units, and means for selectively addressing through said line electrical coded control signals to the remote units by amplitude-modulating the value of said d.c. supply voltage to activate a selected one of said controlled devices;

each remote unit comprising

decoder means connected to said line for decoding the control signals from the control unit, and

comparator means arranged to output an activation signal when the signals from the decoder means correspond to an address associated to a controlled device of the remote unit;

wherein said controlled device of at least one remote unit is a sensor means arranged to monitor a physical quantity and responsive to said activation signals being fed thereto to output to the control unit, via said line, information signals indicative of the value of said monitored quantity, said sensor means including

a sensing element arranged to monitor said physical quantity and output electrical signals indicative of its value,

a signal converter means arranged to convert the electrical signals output by the sensing elements into frequency modulated electrical signals,

current modulator means connected to receive said frequency modulated signals from the converter means and connectable to the said line for the purpose of modulating the current flowing in said line in dependence on said frequency modulated signals,

switch means connected between the current modulator means and said line, and controlled by the comparator means to connect the the modulator means to said line when the comparator means output the activation signal,

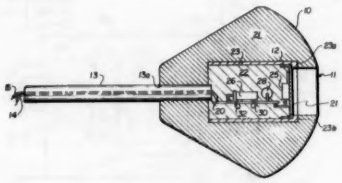
the control unit being provided with frequency demodulator means connected to the said line and arranged to detect the frequency modulation of the current flowing in the line.

4,540,891

HIGH CURRENT FLOAT SWITCH

Robert M. Keener, Ashland, and Shekhar Chakrawarti, Strongsville, both of Ohio, assignors to R. W. Beckett Corporation, N. Ridgeville, Ohio

Filed Nov. 2, 1983, Ser. No. 548,106
Int. Cl.³ H01H *35/18*
U.S. Cl. 307—118 **9 Claims**



1. A float switch for providing a switching path for a high level electric current in response to a fluid level comprising:

a buoyant float housing having a pair of conductors extending through said housing, to provide first and second connection ends for said switching path adapted to receive a potential difference;

a high current solid state switching device inside said housing connected to a heat transfer surface exposed through an aperture of said housing; said device providing a current path between said conductors inside said housing; and

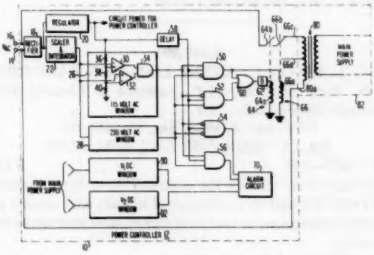
an annular position sensor connected to said switching device, said sensor connected to trigger said switching device into a conducting state in response to a position change of said float, whereby said switching device passes a current between said conductors.

4,540,892

MULTIPLE INPUT VOLTAGE POWER CONTROLLER

John A. Carvalho, Arlington, Mass., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 20, 1983, Ser. No. 563,608
Int. Cl.³ H02M *1/10*
U.S. Cl. 307—130 **5 Claims**



1. A power controller for determining which of a plurality N (N greater than 1) of different possible input power levels is present and for configuring a load to accept the present power level, comprising in combination:

N means, each responsive to said power level being within a

range about a different associated one of N power levels for producing an output signal of one value and for otherwise producing said output signal of another value; and

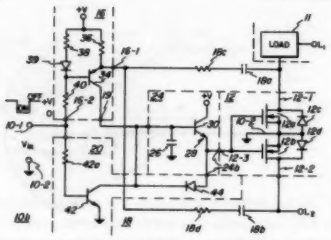
means responsive to the output signals from said N means for configuring said load to accept said present power level.

4,540,893

CONTROLLED SWITCHING OF NON-REGENERATIVE POWER SEMICONDUCTORS

Milton D. Bloomer, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 31, 1983, Ser. No. 499,579
Int. Cl.³ H03K *17/60, 3/26*
U.S. Cl. 307—248 **24 Claims**



1. A method for the controlled switching, between a fully-turned-off condition and a fully-turned-on condition, of a non-regenerative power semiconductor device having a controlled current flow, with a conduction threshold and a saturation threshold, therethrough responsive to a control electrode signal, comprising the steps of:

(a) providing a drive signal having first and second characteristics each respectively for directing the device to an associated one of the fully-turned-on and fully-turned-off conditions of the current flow therethrough;

(b) selecting at least one direction of change between the first and second conditions of said drive signal as an associated controlled direction of change of the control electrode signal;

(c) changing the control electrode signal at a first rate M responsive to a change of the drive signal in each selected controlled direction and until a first encountered one of the thresholds is reached;

(d) then reducing the rate of change of the control electrode signal, in the controlled direction, to a second rate M′ less than the first rate M, until the remaining one of the thresholds is reached; and

(e) then increasing the rate of change of the control electrode signal in the controlled direction at another rate greater than the second rate M′.

4,540,894

PEAK TURN-ON CURRENT LIMITING BASE DRIVE

John N. Park, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,695
Int. Cl.³ H03K *4/60, 5/12, 6/04, 17/94*
U.S. Cl. 307—254 **5 Claims**

1. A base drive circuit for a power switching element responsive to first and second external signals, said second signal occurring subsequent to said first signal, said base drive circuit comprising:

first, second and third transistors;

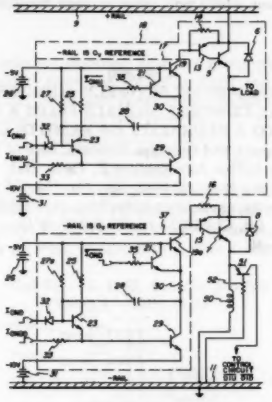
a charging resistor coupling the base of said first transistor to the base of said third transistor;

a capacitor coupling the base of said first transistor to the collector of said second transistor, the emitter of said first transistor connected to the base of said second transistor;

a current limiting resistor coupling the emitter of said third transistor to the collector of said second transistor;

means coupling the collector of said third transistor to said power switching element;

means for coupling the first external signal to said first transistor to provide a ramp signal through said current limiting resistor and said third transistor to said power switching element;



means for coupling said second external signal to said second transistor so as to saturate said second transistor and provide a step of current through said third transistor to said power switching element; and

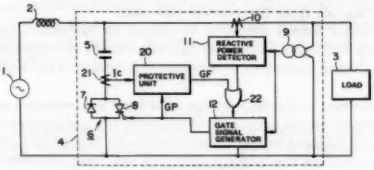
means coupled to said third transistor and responsive to the complement of said first signal for clamping said third transistor and thereby biasing said power switching element out of conduction.

4,540,895

DEVICE HAVING THYRISTORS CONNECTED IN SERIES

Masatoshi Takeda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1983, Ser. No. 492,490
Int. Cl.³ H03K *17/72*
U.S. Cl. 307—252 Q **5 Claims**



1. A device having series connected thyristors, comprising: a current controller including a series circuit consisting of a plurality of thyristors connected in series, and a reverse-blocking semiconductor element connected to said series circuit in an antiparallel relationship; a gate signal generator for feeding a gate signal to the gate of each of said thyristors; and a thyristor protective unit consisting of a circuit for detecting a zero point of the current flowing in said reverse-blocking semiconductor element and generating a zero detection pulse, a monostable multivibrator for generating a pulse of a predetermined duration synchronously with the time of extinction of said gate signal, an AND element so connected as to receive said two

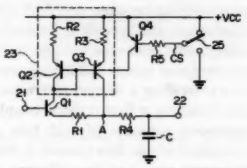
pulses, and means for feeding the output of said AND element as a reignition pulse to said gate signal generator.

4,540,896

VARIABLE RESISTANCE CIRCUIT

Tatsuo Tanaka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 30, 1984, Ser. No. 595,438
Claims priority, application Japan, Mar. 31, 1983, 58-56050
Int. Cl.³ H03K 5/00
U.S. Cl. 307—264 **13 Claims**



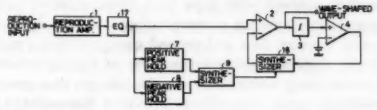
1. A variable resistance circuit comprising:
an emitter-follower transistor having a base coupled to an input terminal, a collector and an emitter;
an impedance element coupled between the emitter of said emitter-follower transistor and an output terminal;
a current mirror circuit whose current input circuit is coupled to the collector of said emitter-follower transistor and whose current output circuit is coupled to said output terminal, a current flowing from said current output circuit being substantially proportional to a current flowing from said current input circuit according to the current mirror operation of said current mirror circuit; and
control circuit means responsive to a control signal and coupled to said current mirror circuit, a proportional relation between currents of the current input and current output circuits of said current mirror circuit being controlled by said control signal so that an effective impedance measured from said output terminal is changed according to said control signal.

4,540,897

DIGITAL MODULATION SIGNAL READING DEVICE

Saburo Takaoka; Ryuichi Naito; Fumihiko Yokogawa, and Youichi Ogawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 507,645
Claims priority, application Japan, Jun. 25, 1982, 57-109336
Int. Cl.³ H03K 5/08
U.S. Cl. 307—268 **6 Claims**



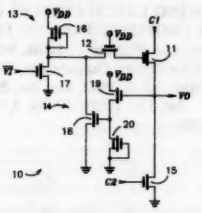
1. A reproduction reading device for reading out a wave-shaped output signal corresponding to an inputted digital information reproduction signal, said reproduction signal having been recorded on a recording medium or transmitted into a transmission medium, with reproduction being performed according to a modulation system in which the time ratio of the high level signal duration to the low level signal duration is substantially unity, comprising: comparator means for comparing the level of a reproduction output signal derived from the inputted reproduction signal, with a feedback comparison level signal, time ratio detecting means for detecting the time ratio of the high level signal duration of a comparator output of said comparator means to the low level signal duration of the same, intermediate level detecting means for detecting substantially an intermediate value of respective positive and negative peak values of said reproduction output signal, and means for adding the outputs of said time ratio detecting means and said intermediate level detecting means to provide an output constituting said feedback comparison level signal; wherein said wave-shaped output signal is outputted from said comparator means.

4,540,898

CLOCKED BUFFER CIRCUIT USING A SELF-BOOTSTRAPPING TRANSISTOR

Joseph Pumo, Austin, Tex., and Marc J. E. Belleville, Grenoble, France, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 7, 1983, Ser. No. 472,898
Int. Cl.³ H03K 3/027, 4/58, 17/04, 19/017
U.S. Cl. 307—269 **8 Claims**



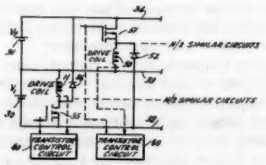
1. A clocked buffer circuit for providing an output signal in response to an input signal and a clock signal, comprising:
a NOR gate having an output, a first input for receiving an inverted input signal, and a second input;
a first transistor having a control electrode coupled to the output of the NOR gate, a first current electrode for receiving the clock signal, and a second current electrode for providing the output signal; and
delay means having an input for receiving the output signal and an output coupled to the second input of the NOR gate for providing a delay signal responsive to the output signal, wherein the delay signal is delayed in time from the occurrence of the output signal.

4,540,899

HAMMER DRIVE CIRCUIT USING POWER MOSFETS

Brian R. Pelly, Palos Verdes Estates, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Sep. 30, 1982, Ser. No. 431,057
Int. Cl.³ H03K 17/60
U.S. Cl. 307—270 **16 Claims**



1. A circuit for a repetitively energized inductive load; said circuit including a transistor, a diode, first and second d-c

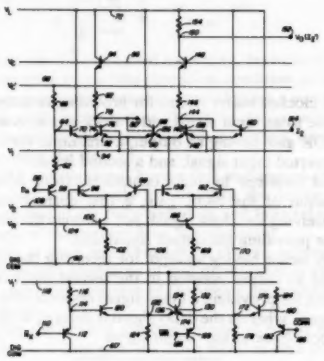
voltage source means, and transistor control circuit means operable to turn said transistor on and off and to cycle said transistor between on and off conditions when the current through said inductive load attempts to fall below a prescribed minimum and rise above a pescribed maximum value respectively, or in response to alternatively derived timing signals which achieve essentially the same result, said transistor being cycled at a cycle rate of greater than about 100 kHz; said first voltage source means, said inductive load and said transistor connected in a first closed series relationship; said first and second voltage source means connected in series with one another with additive polarities, whereby, when said transistor is on, current flows from said first voltage source means, through said inductive load, and when said transistor then turns off, current flows through said diode and into said second voltage source means in a direction to oppose said current flow.

4,540,900

REDUCED SWING LATCH CIRCUIT UTILIZING GATE CURRENT PROPORTIONAL TO TEMPERATURE

Adrian B. Early, and William J. Lillis, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Jul. 1, 1982, Ser. No. 394,487
Int. Cl.³ H03K *19/08, 3/286*
U.S. Cl. 307—289 **12 Claims**



1. A latch circuit for receiving a binary data signal and selectively storing the received binary data signal, comprising in combination:

a. bias transistor means having at least a collector terminal, a base terminal, and first and second emitter terminals;

b. a first power supply conductor for conducting a first power supply voltage;

c. an input transistor having emitter, base, and collector terminals, the collector terminal of said input transistor being coupled to said first power supply conductor, the emitter terminal of said input transistor being coupled to the first emitter terminal of said bias transistor means;

d. input means for providing the binary data signal to the base terminal of said input transistor;

e. a feedback transistor having emitter, base, and collector terminals, the emitter terminal of said feedback transistor being coupled to the second emitter terminal of said bias transistor means, the base terminal of said feedback transistor being coupled to the collector terminal of said bias transistor means, the collector terminal of said feedback transistor being coupled to said first power supply conductor;

f. a second power supply conductor for conducting a second power supply voltage;

g. a gate current source coupled to said second power supply conductor and having an output terminal for providing a regulated gate current having a magnitude substantially proportional to the temperature of said latch circuit;

h. Current steering means having first, second and third current conducting terminals, said first and second current conducting terminals being coupled to the first and second emitter terminals, respectively, of said bias transistor means, said third current conducting terminal being coupled to the output terminal of said gate current source for receiving said regulated gate current, said current steering means including a control means for receiving control signal and being responsive to said control signal for selectively conducting said regulated gate current to said first or second current conducting terminal;

i. a bias circuit coupled between said first and second power supply conductors and having a first reference terminal for providing a first reference voltage to the base terminal of said bias transistor means and having a second reference terminal for providing a second reference voltage; and

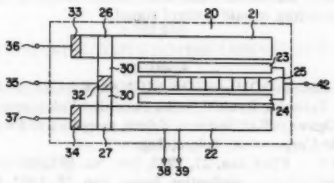
j. load means including a first resistor coupled between the second reference terminal of said bias circuit and the collector terminal of said bias transistor means for generating a first output signal at the collector terminal of said bias transistor means, said first resistor selectively conducting said regulated gate current for causing said first output signal to have an associated voltage signal swing substantially proportional to temperature.

4,540,901

IMAGE-SENSING CHARGE-COUPLED DEVICE WITH BOTH HIGH-SPEED AND LOW-SPEED READ-OUTS

Nobuo Suzuki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 26, 1983, Ser. No. 488,689
Claims priority, application Japan, Apr. 30, 1982, 57-73066
Int. Cl.³ H03K *3/42;* **G11C** *19/28;* **H01L** *29/78, 27/14*
U.S. Cl. 307—311 **2 Claims**

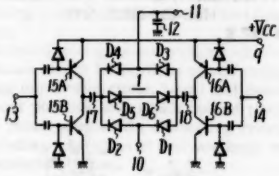


1. In a solid image-sensing device provided with: a light-receiving part comprising a plurality of photosensitive cells disposed in a straight-line state on a semiconductor substrate and generating charges corresponding to light information projected thereon; first and second charge-transfer paths respectively disposed on opposite sides of the light-receiving part for receiving and transferring the charges thus generated; and two shift gates respectively provided between the light-receiving part and the first and second charge-transfer paths and functioning to distribute and transfer the charges generated by the light-receiving part alternately to the first and second charge-transfer paths, the improvement wherein a third charge-transfer path having a discretely independent output part is connected respectively to the output end sides of the first and second charge-transfer paths, and the image-sensing device is operated to read out separate signals from the first and second charge-transfer paths at the time of high-speed readout and to alternately read out signals from the first and second charge-transfer paths by way of the third charge-transfer path at the time of slow-speed readout.

4,540,902
SAMPLE AND HOLD CIRCUIT

Fumio Ishikawa, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,750
Claims priority, application Japan, Dec. 28, 1981, 56-214116
Int. Cl.³ H03K *17/74;* **G11C** *27/02*
U.S. Cl. 307—352 **11 Claims**



1. An integrated sample and hold circuit of the bridge type, comprising:

a diode bridge, having an input terminal and an output terminal;

first and second drive terminals on said bridge;

first and second capacitors coupled to said first and second drive terminals respectively;

first switching means having first and second states coupled between said first and second capacitors;

second and third switching means for producing two control signals of opposite phase at respective outputs in response to input switching pulse signals of opposite phase;

said output of said second and third switching means connected respectively to said first and second capacitors in series with said first and second drive terminals, respectively, for applying said control signals to said capacitors for turning said bridge ON and OFF;

said first switching means being in said first state when said bridge is turned OFF and being in said second state when said bridge is turned ON;

said capacitors establishing the voltage at both said drive terminals at a voltage equal to the voltage appearing at said input terminal in response to said first state of said first switching means; and

said first capacitor establishing the voltage at said first drive terminal at a voltage equal to said input voltage plus a predetermined offset voltage and said second capacitor establishing the voltage at said second drive terminal at a voltage equal to said input voltage minus said predetermined offset voltage in response to said second state of said first switching means.

4,540,903
SCANNABLE ASYNCHRONOUS/SYNCHRONOUS CMOS LATCH

Laurence H. Cooke; Robert A. Feretich, and Richard F. Boyle, all of Santa Clara County, Calif., assignors to Storage Technology Partners, Louisville, Colo.

Filed Oct. 17, 1983, Ser. No. 542,829
Int. Cl.³ G11C *11/28*
U.S. Cl. 307—465 **13 Claims**

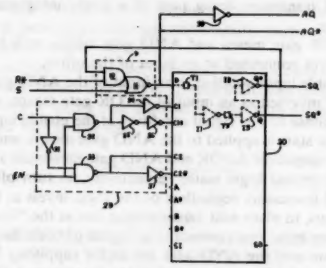
1. A scannable latch circuit comprising:

first latch means, operable in a first mode of operation, for providing and maintaining a first data bit output signal at a first level in response to a specified change in a data bit input signal applied to an input terminal of said scannable latch circuit, said first data bit output signal being connected to a first output terminal;

reset means, also operable in said first mode of operation, for resetting said first data bit output signal to a second level in response to a reset signal applied to a reset terminal of said scannable latch circuit;

second latch means, operable in a second mode of operation for providing and maintaining a second data bit output signal connected to a second output terminal, and having a level that is equivalent to the level of said data bit input signal immediately prior to the occurrence of a specified transition in a first clock signal applied to a clock terminal of said scannable latch circuit, said second latch means maintaining the level of the second data bit output signal for the entire duration of a cycle of said first clock signal;

shift means, operable in a third mode of operation, for selectively allowing data bit signals to be shifted into or out of said second latch means, said shift means including output means for shifting said data bit signals out of second latch means that is separate from said first and second data bit output signals provided by said first and second modes of operation, respectively; and

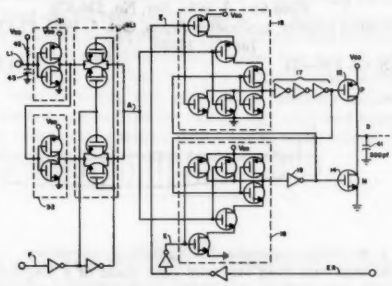


select means for selecting the mode of operation of said scannable latch circuit, and for controlling the operation thereof.

4,540,904
TRI-STATE TYPE DRIVER CIRCUIT

John J. Ennis, Corona, and Robert K. Booher, Temecula, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 3, 1983, Ser. No. 491,108
Int. Cl.³ H03K *19/094, 17/284, 19/20, 3/037*
U.S. Cl. 307—473 **1 Claim**



1. A tristate driver circuit having first and second logic states which are approximately the potentials at the positive and negative poles of a direct-current bias supply and a "float" state which is an intermediate potential at high impedance, said driver circuit comprising a P-type and an N-type field effect transistors, each having a source, a drain and a gate terminal, with the drain terminals of both transistors connected to a driver output line, the source terminals of the P-type and the N-type transistors connected respectively to the positive and negative poles of the direct-current bias supply;

an OR gate means having three inputs, and having an output

connected to the gate terminal of said P-type transistor, with the OR gate means comprising a NOR gate followed by an odd number of inverters;

an AND gate means having three inputs and having an output connected to the gate terminal of said N-type transistor, with the AND gate means comprising a NAND gate followed by an odd number of inverters;

wherein the NOR gate, the NAND gate, and each inverter comprises P-type and N-type field effect transistors, each transistor having source, gate, and drain electrodes, all of said transistors being part of a single integrated circuit chip;

said OR gate means and AND gate means each having its output connected to an input of the other;

an enable input coupled to an input of the AND gate means and inverted as an input of the OR gate means, so that in response to one signal condition at the enable input a first logic state is applied to the AND gate means, and thereby the outputs of the OR and AND gate means are at the first and second logic states respectively, to turn off both of said transistors regardless of the logic levels at the other inputs, to place said driver output line at the "float" state;

a driver input line connected to inputs of both the OR gate means and the AND gate means for supplying logic signals at the first and second states alternately, so that with an enable signal condition at the input, which provides a second logic state input signal to the OR gate means and a first logic state input signal to the AND gate means, the driver circuit repeats the logic signal from the driver input line in inverted form to the driver output line, the first state at the output line having the P-type transistor on and the N-type transistor off, and vice versa for the second state at the output line, and AND gate means and OR gate means each providing some delay effectively in tandem, so that in resonse to a change of state at the driver input line the transistor which is on is first turned off, and after a short delay the transistor which was off is turned on, so that during a change between the first and second logic states at the output there is a definite interval during which the output is at the high-impedance "float" state.

4,540,905

ELECTROMAGNETIC DRIVING DEVICE

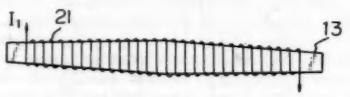
Seiji Morino, Okazaki, and Hisasi Kawai, Toyohashi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 3, 1983, Ser. No. 538,570

Claims priority, application Japan, Oct. 5, 1982, 57-173847

Int. Cl.³ H02K *33/00*

U.S. Cl. 310—12 **4 Claims**



1. An electromagnetic driving device comprising:

at least one fixed magnetic core made of a longitudinally extending bar of magnetic material, the cross-sectional area of the central portion of said bar being greater than the cross-sectional area of the end portions of said bar, the cross sectional area of said bar being linearly reduced along the the length of said bar, from said central portion, where said cross-sectional area is greatest, towards said end portions;

a coil wound along the length of said at least one fixed magnetic core from one end to the other end thereof; and

at least one movable member made of a magnet arranged in proximity to said at least one fixed magnetic core having said coil for producing a magnetic flux crossing approximately perpendicularly the current of said coil and for being adapted to move along the axis of said at least one fixed magnetic core.

4,540,906

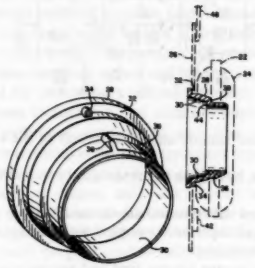
STATOR ASSEMBLY FOR PERMANENT MAGNET ROTARY DEVICE

Hans A. Blom, Portland, Oreg., assignor to Synektron Corporation, Portland, Oreg.

Filed Mar. 9, 1984, Ser. No. 588,138

Int. Cl.³ H02K *5/00*

U.S. Cl. 310—67 R **13 Claims**



1. In an electrical machine having a generally annular core of magnetically-permeable material with an aperture extending centrally therethrough, an electrically-conductive winding mounted on said core, a rotor having permanent magnets mounted thereon positioned in surrounding relationship to said core and being mounted for rotation with respect to said core about an axis, and a current transmission circuit board extending transversely to said axis and being spaced axially from said core for supplying electrical current to said winding and for mounting Hall effect sensors for sensing the magnetic fields of said permanent magnets as said permanent magnets rotate, the improvement which comprises a member matingly insertable axially through said aperture in said core while said winding is mounted thereon for connecting said core and circuit board to each other, said magneticaly-permeable material of said core having first angular orientation means formed therein and said member having second angular orientation means matingly connectable with said first angular orientation means upon axial insertion of said member through said aperture while said winding is mounted on said core for positioning said circuit board with respect to said core in a predetermined angular relationship about said axis, said member further having first axial orientation means matingly connectable with said core while said winding is mounted thereon for positioning said circuit board at a predetermined spaced axial distance from said core.

4,540,907

ALTERNATOR-RECTIFIER UNIT WITH ECONOMICAL CONNECTIONS TO WIRES EMBEDDED IN A CIRCUIT BOARD

Walter Hagenlocher; Lutz Rapp, both of Stuttgart; Werner Eschen, Köngen; Istvan Ragaly, Schwieberdingen; Heinz Scharpf, Remshalden; Jörg Streller, Affalterbach; Johann Weigand, Güglingen, and Klaus Winkler, Freiberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,266

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3208893

Int. Cl.³ H02K *11/00*

U.S. Cl. 310—68 D **9 Claims**

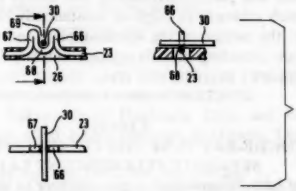
1. An engine-driven alternator-rectifier unit, suitable for vehicular service, having a shaft-mounted rotor carrying an

excitation winding, a stator equipped with windings for producing 3-phase a.c., a 3-phase full wave rectifier having at least three positive-pole diodes and three negative-pole diodes for rectifying said 3-phase a.c. and further comprising:

a flat circuit board of insulating material having parallel surface planes and oriented perpendicular to and extending at least partially around the axis of the shaft on which said rotor is mounted, and

circuit conductor wires embedded in said circuit board for contributing to the interconnection of said diodes and said windings,

said circuit board having cut-out portions which are substantially vacant except for portions of said embedded wires extending out of said circuit board and passing through said cutout portions, and which cut-out portions are located at places selected for connecting external conductors, including lead wires of said windings, respectively, to said embedded wires,



said portions of said embedded wires at said selected places passing through said cut-out portion of said circuit board, being substantially longer than required for crossing said cut-out portions, and each having an intermediate length of wire bent at both ends in first planes of bending which are substantially parallel or identical so as to bring a major part of said intermediate wire length outward beyond one of the surface planes of said circuit board and additionally bent in at least one direction perpendicular to said first planes of bending to provide a U-shaped configuration, protruding at least in part from a said cut-out portion of said circuit board, for grasping a portion of a wire lead external to and otherwise connected with said circuit board,

three of said intermediate wire lengths of said embedded wires being pinched at said U-shaped configurations thereof so as to clamp respective lead wires of said windings in respect to the electrical connections between embedded wires and said lead wires of said windings.

4,540,908

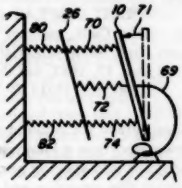
SHOCK ABSORBER FOR QUARTZ CRYSTALS

Charles W. Mooney, Lake Worth; Robert E. Phipps, Pompano Beach, and William J. Kuznicki, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 13, 1984, Ser. No. 627,249

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—326 **13 Claims**



1. A shock absorbing insert for protection of a planar crystal device against impact with a crystal enclosure wall, said crystal device having opposed major surfaces and an edge, said shock absorbing insert comprising:

first springing means having a first spring rate associated therewith;

carrier means for holding said first springing means between one of said major surfaces and said enclosure wall so that said first springing means will contact one of said major surfaces when said crystal device is shocked by a force exceeding a predetermined magnitude in a direction toward said first springing means and substantially perpendicular to said opposed major surfaces;

a spring cushion disposed between and mechanically coupling said carrier means and said enclosure wall, said spring cushion having a spring rate associated therewith which is less than said first spring rate.

4,540,909

TUNING FORK TYPE QUARTZ CRYSTAL RESONATOR WITH VARIABLE WIDTH BASE

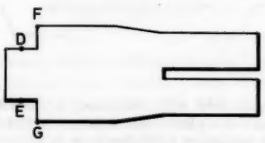
Kunihiro Takahashi, and Nobuyoshi Matsuyama, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Mar. 29, 1984, Ser. No. 594,536

Claims priority, application Japan, Apr. 4, 1983, 58-59018; May 25, 1983, 58-92059

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—370 **25 Claims**



1. A tuning fork type quartz crystal resonator utilizing a coupling between the fundamental flexural and fundamental torsional modes of vibration, said resonator comprising a base having head and tail ends and two tuning fork arms extending from the head end of said base, the length of said base between the head and tail ends thereof being larger than that of said tuning fork arms, said base having a relatively wide width portion near the tuning fork arms, and a relatively narrow width portion spaced from the tuning fork arms and being effective to lower the vibrating displacements of the tail end of the base attributable to torsional mode vibration.

4,540,910

SPARK PLUG FOR INTERNAL-COMBUSTION ENGINE

Ryoji Kondo, Okazaki; Kozo Takamura, Nagoya, and Kanji Higuchi, Hekinan, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 17, 1983, Ser. No. 552,964

Claims priority, application Japan, Nov. 22, 1982, 57-204920; Mar. 16, 1983, 58-45236

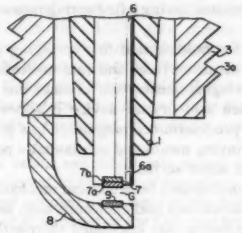
Int. Cl.³ H01T *13/20*

U.S. Cl. 313—11.5 **8 Claims**

1. A spark plug for internal-combustion engines having a spark discharge gap defined between at least two electrodes opposing to each other, and a platinum-containing wear-resistant discharging layer provided on one of said electrodes, said spark plug comprising:

a thermal stress relieving layer disposed between said dis-

charging layer and the base metal constituting said one electrode, said thermal stress relieving layer being made of



a platinum base alloy containing nickel which is a main constituent of said base metal.

4,540,911

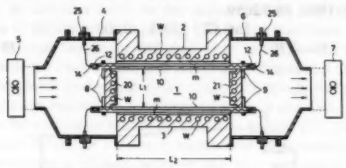
HALOGEN LAMP UNIT

Tetsuji Arai, and Tatsushi Igarashi, both of Hyogo, Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1982, Ser. No. 438,788

Int. Cl.³ H01J *1/02*

U.S. Cl. 313—44 **1 Claim**



1. A halogen lamp unit comprising a plurality of halogen lamps arranged in a plane, each halogen lamp having a sealed tubular body including a tubular outer wall portion and two bare sealed end portion, each said lamp defining a length, and a conductive member at each said end portion, each end portion hermtically enclosing its respective conductive member, holders mounted on mirrors and adpated to hold the halogen lamps in place, each of said holders engaging said tubular outer wall portion adjacent to said end portions, said mirrors being cooled by a water-cooling system, and means for flowing cooling air generally parallel to the length of said lamps, said bare sealed end portions being exposed to the flow of said cooling air.

4,540,912

SPARKING-PLUG

Michel G. P. Matesco, Moingt Montbrisson, France, assignor to Eyquem, Manterre, France

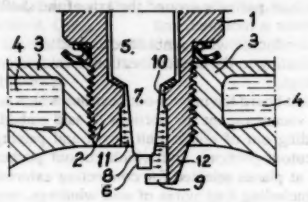
Filed Oct. 15, 1981, Ser. No. 311,654

Claims priority, application France, Oct. 17, 1980, 80 22227

Int. Cl.³ H01T *13/20*

U.S. Cl. 313—142 **9 Claims**

1. A sparking-plug for a combustion chamber of an internal combustion engine having a controlled ignition, and where a flame front develops in the combustion chamber, said sparking-plug comprising a barrel, a center electrode, an earth electrode, an insulator for the center electrode, said insulator having a nose, means for removing heat from said earth electrode, from the center electrode and from the end of said nose of said insulator, said end being disposed relative to said barrel to project into said combustion chamber wherein said end will be partly exposed to the flame front and will be partly masked off from said flame front by said means for removing the heat, said means for removing the heat includuing earth electrode heat removal means for projecting into said chamber and only partially surrounding said center electrode, said heat removal means comprising an extension of said barrel, said extension constituting a relatively massive support for said earth electrode and being formed integrally with said barrel in the manufacture of said barrel, said support extending axially from an



edge of said barrel at least to the outer end of said center electrode and partly surrounding said center electrode on an arc which subtends an angle of substantially between 60° and 120° at the center of the sparking-plug and with the earth electrode extending radially and rectilinearly from the end of said support.

4,540,913

CATHODE-RAY TUBE FOR COLOR DISPLAY WITH SEPARATE FLUORESCENT LAYER

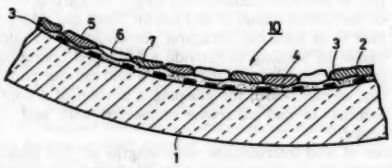
Takashi Ishii, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1983, Ser. No. 476,336

Claims priority, application Japan, Apr. 8, 1982, 57-60073

Int. Cl.³ H01J *29/26*

U.S. Cl. 313—466 **7 Claims**



1. A cathode-ray tube for color display, comprising:

a face plate (1), said face plate having an inner surface,

a picture element layer (10) formed on the inner surface of said face plate and including a plurality of kinds of luminescent picture elements (5, 6 and 7), and

a separate flourescent material layer (4) separately formed on the inner surface of said face plate together with said picture element layer, said separate layer having a 10 percent afterglow time less than 50 microseconds.

4,540,914

ABSORBING GRADED NITRIDE FILM FOR HIGH CONTRAST DISPLAY DEVICES

T. Grant Maple, Byron, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

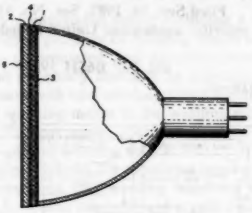
Filed Dec. 17, 1982, Ser. No. 450,665

Int. Cl.³ H01J *29/20*

U.S. Cl. 313—466 **15 Claims**

1. In a viewing screen for a luminescent display device, a transparent viewing portion, a luminescent phosphor layer on the interior surface of said viewing portion and a light absorbing inhomogeneous film covering and adherent to said phosphor layer, said film characterized by having a tapered composition varying continuously from a metal nitride at a point

remote from said interface at the phosphor-film interface to the metal constituent of said nitride such that said film exhibits a continuous gradient of refractive index from an index of said



phosphor at the phosphor-film interface to an index approximating the index of said metal at said remote point, and said metal nitride being selected from the group of nitrides consisting of aluminum nitride and silicon nitride.

4,540,915

FLUORESCENT LAMP AND PHOSPHOR COATING COMPOSITION USED THEREFOR

Kouki Shinkai, Tokyo; Naoki Hagiwara, Ome, and Masaki Nakano, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,262

Claims priority, application Japan, Apr. 30, 1981, 56-63935; Apr. 30, 1981, 56-63936

Int. Cl.³ H01J *1/63*

U.S. Cl. 313—486 **11 Claims**

1. A fluorescent lamp having a phosphor layer formed on the inner wall of the glass tube of the lamp, said phosphor layer being composed of a glass material represented by the general formula: $xLn_2O_3.yMO.wM'.vM_2''O.zB_2O_3$ (wherein Ln is at least one element selected from the group consisting of Y and lanthanum series elements, M is at least one element selected from the group consisting of Mg, Ca, Sr, Ba and Zn, M' is at least one oxide selected from the group consisting of Al_2O_3, SiO_2 and Sb_2O_3, M'' is at least one element selected from the group consisting of Li, Na and K, and x, y, z, w and v are the numerical values defined by $1 \leqq x \leqq 30$, $0 \leqq y \leqq 60$, $0 \leqq w \leqq 20$, $0 < v \leqq 15$ and $30 \leqq z \leqq 80$ in molar percent, respectively, but $y+w$ is a value defined by $0 \leqq y+w \leqq 60$ in molar percent) and a phosphor blended in an amount of 10 to 1000 parts by weight to one part by weight of said glass material.

4,540,916

ELECTRON GUN FOR TELEVISION CAMERA TUBE

Masanori Maruyama, Kokubunji; Masakazu Fukushima, Tokyo; Shinichi Kato, Mobara, and Chihaya Ogusu, Tokyo, all of Japan, assignors to Nippon Hoso Kyokai and Hitachi, Ltd., both of Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,335

Claims priority, application Japan, Oct. 30, 1981, 56-173003; Oct. 30, 1981, 56-173004

Int. Cl.³ H01J *29/46, 29/56*

U.S. Cl. 315—16 **23 Claims**

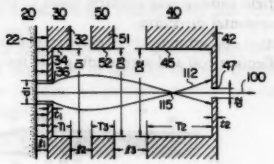
1. A cross-over type diode electron gun for a television camera tube comprising:

a cathode for emitting electrons along a beam axis;

a first grid for being supplied with a positive voltage relative to the cathode and being disposed subsequently to said cathode along the beam axis and having a first aperture for passing electrons emitted from said cathode;

a second grid for being supplied with a higher positive voltage than that supplied to said first grid and being disposed subsequently to the first grid along the beam axis and having a second aperture disposed parallel to and coaxial with said first aperture; and

means for forming a divergent electron lens near said first aperture between said first and second grids to cause the paths of said electrons to cross over on the beam axis at a



point of high potential between said divergent electron lens and said second aperture.

4,540,917

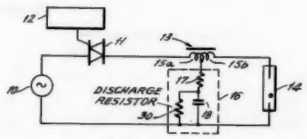
PULSE NETWORK FOR FLUORESCENT LAMP DIMMING

David G. Luchaco, Macungie, and Jonathan H. Ference, Point Pleasant, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Apr. 5, 1983, Ser. No. 482,148

Int. Cl.³ G05F *1/00;* **H05B** *37/02, 39/04, 41/36*

U.S. Cl. 315—291 **14 Claims**



1. A pulse dimming ballast containing a pair of a-c terminals, a ballast inductor and a gas discharge lamp load each connected in series with one another and with said pair of a-c terminals; said pair of a-c terminals being excitable from an a-c source and through a phase control switching means; said ballast inductor having a winding tap; a pulse network for restriking said gas discharge lamp during each half cycle of said a-c source; said pulse network comprising a series connected resistor and capacitor connected at one end to said winding tap and at the other end to one of said pair of a-c terminals whereby said pair of a-c terminals, said phase control switching means, said pulse network and a portion of said ballast inductor are connected in series with one another; wherein the improvement comprises a discharge resistor connected directly in parallel with at least one component of said pulse network, said discharge resistor being sized to ensure substantially complete discharge of said capacitor during non-conductive periods of said phase control switching means.

4,540,918

COIL DEVICE FOR IMAGE PICKUP TUBE

Junichi Yamanaka, Sagamihara, and Masataka Kusaka, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 24, 1982, Ser. No. 411,004

Claims priority, application Japan, Aug. 27, 1981, 56-133364

Int. Cl.³ H01J *29/56*

U.S. Cl. 315—371 **6 Claims**

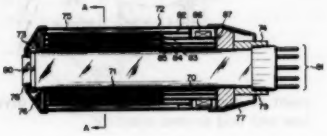
1. An image pickup device for a television camera comprising:

an image pickup tube having a target and means for scanning the target with an electron beam and producing an electric signal corresponding to an image formed on said target;

a vertical deflection coil, surrounding said tube, for generating a vertical deflection magnetic field causing said electron beam to scan the target in the vertical direction;

a horizontal deflection coil, arranged between the image pickup tube and said vertical deflection coil and surrounding said tube for generating a horizontal deflection magnetic field causing said electron beam to scan the target in the horizontal direction;

a correction coil arranged between the tube and the horizontal deflection coil and surrounding said image pickup tube



for generating a correction magnetic field in the same direction as said vertical deflection magnetic field, said correction magnetic field being generated in part of said vertical deflection magnetic field; and

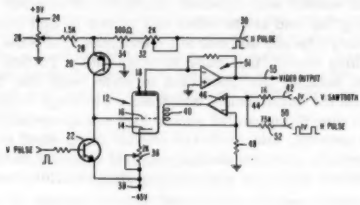
a circuit for generating a correction signal having a period shorter than that of a horizontal drive pulse, the correction signal being supplied to said correction coil.

4,540,919

METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLING HIGHLIGHT EFFECTS

John O. Ryan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 8, 1982, Ser. No. 338,194
Int. Cl.³ H01J *29/52*
U.S. Cl. 315—384 **11 Claims**



1. A circuit for suppressing highlight effects, comprising;

an image tube having a single control grid, a cathode and a target;

current source transistor means coupled to the single control grid;

a main beam control source coupled to the transistor means;

a horizontal pulse source for generating a superimposed grid pulse also coupled to the transistor means;

resistive means coupled to the cathode and responsive to the superimposed horizontal grid pulse for sufficiently raising the cathode voltage during the retrace scan to prevent readout of the normal video portions while allowing discharge of the highlight portions of the target; and

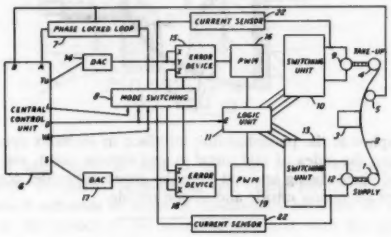
means coupled to the tube for insuring that the retrace scan arrives at given areas of the target prior to the arrival at the area of the active picture scan.

4,540,920

RELATING TO TAPE TRANSPORT CONTROL SYSTEMS

David S. Cutler, Wells, and Keith G. Spouse, Feocck, both of England, assignors to EMI Limited, Hayes, England

Filed Sep. 16, 1982, Ser. No. 418,676
Claims priority, application United Kingdom, Sep. 17, 1981, 8128112
Int. Cl.³ B65H *59/38*
U.S. Cl. 318—7 **6 Claims**



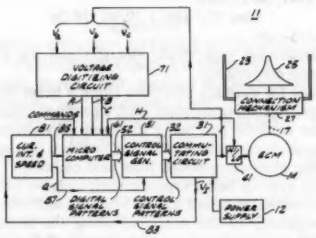
1. A tape transport system comprising a control unit, a take-up motor for driving a take-up reel, a supply motor for driving a supply reel, and first and second pulse switched servo units coupling said control unit to said take-up motor and supply motor respectively, said pulse switched servo units each comprising an error device, a pulse width modulator for varying current to said associated motor, and a switching unit for reversing said motor current, the system further comprising a tape transfer sensing means for monitoring the length of tape transferred between said reels, a tape velocity sensing means for sensing deviations in velocity of said tape transfer from a predetermined required velocity, a take-up motor current sensing means and a supply motor current sensing means for sensing respectively deviations in take-up motor current and supply motor current from respective pre-determined motor currents, the control unit being arranged to evaluate respective selected current levels for the take-up and supply motors in response to signals received from said tape transfer sensing means, said error devices being arranged to generate correcting signals to correct said respective selected current levels, in dependence on said deviations sensed by said tape velocity sensing means or said respective motor current sensing means.

4,540,921

LAUNDRY APPARATUS AND METHOD OF CONTROLLING SUCH

John H. Boyd, Jr., and Alexander Muller, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 19, 1984, Ser. No. 602,163
Int. Cl.³ D06F *33/00*; H02P *6/02*
U.S. Cl. 318—254 **38 Claims**



1. Laundry apparatus comprising:

means operable generally in a washing mode for agitating water and fabrics to be laundered therein and operable generally in a spin mode for thereafter spinning the fabrics to effect centrifugal displacement of water from the fabrics;

an electronically commutated motor including a stationary assembly having a plurality of winding stages adapted to be selectively commutated, and rotatable means associated with said stationary assembly in selective magnetic coupling relation with said winding stages for driving said agitating and spinning means in the washing mode operation and in the spin mode operation thereof upon the commutation of said winding stages;

first and second conductors for supplying power;

means for commutating said winding stages by selectively switching said winding stages to said supply conductors in response to a pattern of control signals leaving at least one of said winding stages unpowered at any one time while the other said winding stages are powered;

means coupled to said winding stages for digitizing the voltages across said winding stages;

means responsive to successive patterns of digital signals for generating successive patterns of the control signals for said commutating means; and

a digital computer operating under stored program control, said computer having inputs for the digitized voltages, said computer having memory elements for storing data representing at least one preselected sequence of the patterns of the digital signals and for storing data, corresponding to each pattern of the digital signals, identifying the respective input for the digitized voltage for said at least one unpowered winding stage, said computer successively producing one of the patterns of the digital signals, sensing only the digitized voltage at the identified input corresponding to the one pattern and producing the following pattern in sequence after at least one predetermined logic level of the digitized voltage at the identified input has occurred.

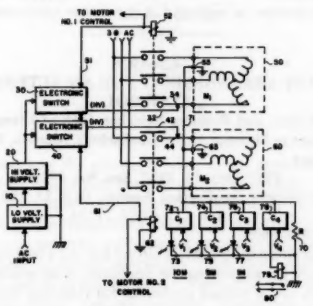
4,540,922
MOTOR WINDING LEAKAGE MONITOR

Joseph G. Horvath, Astatula, and James C. Miller, Tavares, both of Fla., assignors to Automeg, Inc., Astatula, Fla.

Continuation-in-part of Ser. No. 477,340, Mar. 21, 1983, abandoned. This application Sep. 17, 1984, Ser. No. 651,441

Int. Cl.[3] **G01R** *27/18;* **G08B** *21/00*

U.S. Cl. 318—490 **9 Claims**



7. A device for monitoring the leakage resistance of an electric motor or the like only when the motor is non-operated, said motor having a control switch, comprising:

a high voltage direct current power supply having a system ground and a high voltage output;

a sense resistor connected from the motor frame to said system ground;

electronic switch means connected between said high voltage output and the windings of said motor, said switch means having a control input connected to said control switch for causing closure of said electronic switch means when said control switch is open and for causing opening of said electronic switch means when said control switch is closed; and

a comparator connected to said sense resistor for producing an output indication of leakage current flowing through said sense resistor when such current exceeds a preselected magnitude.

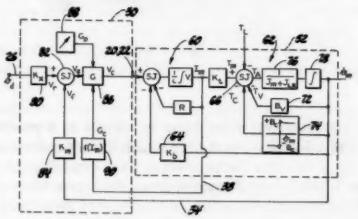
4,540,923
ADAPTIVE SERVOMOTOR CONTROLLER

Alexander Kade, Detroit, and Sam M. Karadsheh, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 14, 1984, Ser. No. 609,779

Int. Cl.[3] **G05B** *13/00, 11/01*

U.S. Cl. 318—561 **4 Claims**



1. For a process control system including a source of electricity, a servomotor adapted to drive a load mechanism, and a servomotor controller for energizing the servomotor with current from the source to generate motor torque which overcomes the load mechanism torque and the motor coulomb friction torque to drive the load mechanism through a predetermined and cyclic sequence of movements for carrying out the steps of a process, the level of motor energization being determined as a function of the difference between actual and desired values of a motor operating parameter and a gain factor chosen to result in a desired level of response stability, a method of operation comprising the steps of:

monitoring the motor current over at least one cycle of said process and identifying the minimum motor current value occurring therein;

comparing the identified current value with a reference value corresponding to the average minimum motor current which occurs when the controller is operated at the desired level of response stability and developing a deviation signal as a function of the difference therebetween to obtain an indication of variation in the motor coulomb friction torque; and

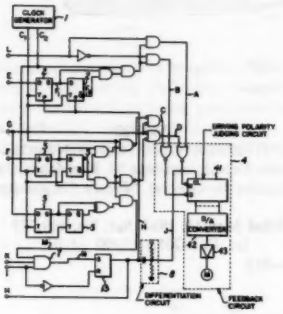
adjusting the controller gain factor by a correction amount determined in relation to said deviation signal such that the gain factor is increased with increasing coulomb friction torque and decreased with decreasing coulomb friction torque, thereby to maintain the desired level of response stability despite variation in the motor coulomb friction torque.

4,540,924

SYSTEM FOR POSITIONING AN OBJECT AT A PREDETERMINED POINT FOR A DIGITAL SERVO DEVICE

Hayao Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,159
Claims priority, application Japan, Feb. 5, 1982, 57-17722
Int. Cl.³ G05B *19/42*
U.S. Cl. 318—568 **3 Claims**



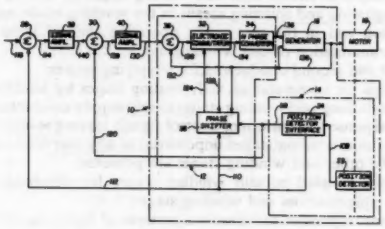
1. A system for positioning an object at a predetermined point in a digital servo device which has a mechanical driving device, a detector for producing an A-phase signal and a B-phase which are different in phase timing to each other and which are used for detecting the amount of the operation of the driving device and for producing a Z-phase signal for detecting the origin of said detector itself, a feedback circuit, and an interface circuit, said interface circuit having a clock generator for generating two clock signals whose timings at active levels are not coincident with each other, a receiving shift-register for receiving operating command pulses in synchronization with the clock signals, a first gate circuit for producing a positive and a reverse direction command pulses A and B on the basis of both the output from the receiving shift-register and an operating direction command signal at the rising edge of the level of one operating command pulse, a pair of receiving shift-registers for receiving the A-phase signal and the B-phase signal from the detector in synchronization with the clock signals, a second gate circuit for producing a positive and a reverse direction detecting pulses C and D on the basis of the outputs from the pair of receiving shift-registers, and an AND circuit for carrying out an AND operation among the outputs from one of said pair of receiving shift-registers, the Z-phase signal and a command signal for positioning an object at a predetermined point whereby the AND circuit produces as an output a predetermined point detecting signal, the improvement comprising: a position detecting flip-flop connect to be set by said predetermined point detecting signal, the flip-flop being connected such that the positive and the reverse direction command pulses A and B are inhibited from being produced by locking the first-mentioned receiving shift-register in response to the output from the flip-flop and the feedback circuit is reset by a reset signal having a pulse width which is wide enough for obtaining a resetting condition at the start of resetting but not so wide that the next positive and reverse direction detecting pulses C and D are extinguished.

4,540,925

CONTROL SYSTEM FOR ELECTRIC MOTOR

Donald H. Jones, Pittsburgh, Pa., assignor to Contraves Goerz Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 530,252, Sep. 8, 1983, abandoned. This application Jul. 19, 1984, Ser. No. 632,315
Int. Cl.³ G05B *19/28*
U.S. Cl. 318—602 **4 Claims**



1. A control system for current supplied to an electric motor having a stationary member, a movable member and no mechanical commutator, so as to produce a desired torque at minimum motor excitation current, comprising:

a. detector means coupled to the movable member for determining a position and velocity of that member relative to the stationary member and furnishing signals related thereto respectively:

b. command means connected to receive the signals from the detector means, and providing a motor command signal therefrom, the command means including:

(i) phase shift means which receive the position and velocity signals and a torque direction signal and determine a spatial relationship between the movable member and a resultant stationary member field that permits the motor to produce the desired torque with a minimum motor excitation current, and provides an orientation command signal; and

(ii) commutator means coupled to the phase shift means and receiving the orientation command signal and a torque error signal, and producing therefrom the torque direction signal and a motor command signal; and

c. generator means connected to the command means to receive the motor command signal, and connected to the stationary member of the motor to supply excitation current thereto in response to the motor command signal.

4,540,926

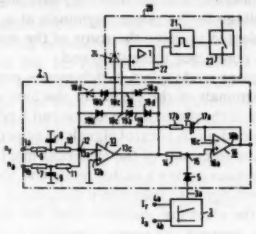
CIRCUIT ARRANGEMENT FOR AN ALTERNATING CONTROL

Walter Kölzer, and Wilhelm Reischer, both of Vienna, Austria, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,834
Claims priority, application Austria, Dec. 23, 1981, 5529/81
Int. Cl.³ G05B *11/36*
U.S. Cl. 318—609 **4 Claims**

1. In an alternating control circuit having a first controller of the PI type for regulating the operation of an electromechanical device and a second controller for relieving said first controller under predetermined conditions, said first controller comprising a first operational amplifier with an output connected to an inverting input via a feedback loop including a decoupling component and an RC stage, said second controller having an output connected via a decoupling diode to said decoupling component on a side thereof opposite the output of said first operational amplifier, the improvement where said decoupling component is a resistor and said feedback loop includes a second operational amplifier wired as an impedance transformer with a non-inverting input connected to the output

of said first operational amplifier via said resistor and to said second controller via said diode, said second operational amplifier having an output connected to said RC stage and connectable to said device for delivering a control signal thereto.

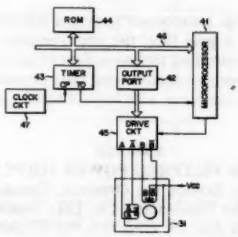


4,540,927

TWO SPEED STEP MOTOR DRIVING APPARATUS FOR COPYING MACHINES

Yasufumi Tanimoto, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 2, 1983, Ser. No. 557,583
Claims priority, application Japan, Dec. 3, 1982, 57-212154
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **6 Claims**



1. An apparatus for driving a pulse motor provided with a plurality of windings, said pulse motor being used for scanning in a copying machine, said apparatus comprising:

excitation phase designating means for selectively setting a document scanning mode and a return mode designating the phase windings alternately from one phase to two phases and from two phases to one phase in the document scanning mode, and successively designating the phase windings in pairs with every two phases in the return mode, the pulse motor being rotated faster in the return mode than the document scanning mode; and

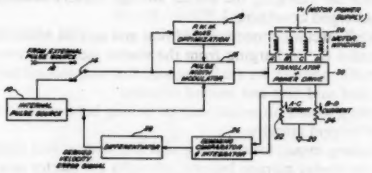
drive circuit means for suplying a drive pulse and drive pulses alternately to the one phase winding and two phase windings designated by the excitation phase designating means in the document scanning mode, and supplying drive pulses to the two phase windings designating by the excitation phase designating means in the return mode.

4,540,928

CLOSED LOOP RESONANCE COMPENSATION CIRCUIT FOR STEPPER MOTORS

Michael Marhoefer, Chicago, Ill., assignor to Bodine Electric Company, Chicago, Ill.

Filed Mar. 19, 1984, Ser. No. 591,020
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **12 Claims**



1. A closed loop resonance compensation circuit for a stepper motor comprising

(a) a source of command pulses,

(b) a pulse width modulator and pulse width bias optimization means connected to said source for receiving command pulses therefrom,

(c) driving means for the stepper motor windings connected to the output of said pulse width modulator,

(d) comparator means connected to said stepper motor windings for comparing the averaged sum of the winding currents with the sum of the instantaneous winding currents and for generating a signal having a pulse width corresponding to the difference between the compared currents,

(e) integrating and differentiating means connected to said comparator means for providing a velocity error signal representing rotor velocity variations about a nominal rotor speed,

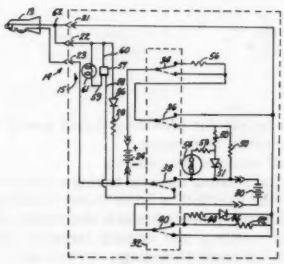
(f) feedback means between the integrating and differentiating means, and the pulse width modulator for applying the velocity error signal to the pulse width modulator to modulate the width of the pulse width modulator output pulse to the motor driving means to correct the average rotor velocity with respect to the stator field.

4,540,929

BATTERY RECHARGER

Bruce I. Binkley, Seattle, Wash., assignor to Energy Exchange Systems, Seattle, Wash.

Filed Feb. 16, 1984, Ser. No. 580,618
Int. Cl.³ H02J *7/00*
U.S. Cl. 320—2 **16 Claims**



1. A starting aid for motors having a starter storage battery, comprising:

at least first and second rechargeable batteries, said first and

second batteries having a combined nominal voltage when connected in series greater than the voltage of the starter storage battery, and each having a nominal voltage substantially less than the nominal voltage of the starter storage battery, and said first and second batteries having a rated current output substantially smaller than the starter storage battery but sufficient to transfer enough charge to the starter storage battery to start the motor;

a first circuit connecting said first and second batteries in series for charging the starter storage battery when in a discharged condition;

a second circuit connecting said first and second batteries in parallel for recharging from the starter storage battery;

a portable housing for enclosing said first and second batteries and said first and second circuits;

switching means for selectively switching between said first and second circuits;

connecting means for coupling said first and second circuits to the starter storage battery, whereby the starter storage batter, when in a discharged state, may be charged by said first and second batteries, and when in a charged state, may be used to recharge said first and second batteries with or without the motor being operated, said connecting means including a cable having a removable connector at an end thereof for connection to a connector mounted on said housing and a removable plug at an opposite end thereof for insertion into a vehicle cigarette lighter outlet to place the positive and negative terminals of the starter storage battery in electrical connection with said first and second circuits; and

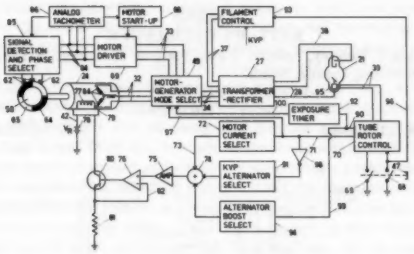
indicator means for indicating said removable connector is connected to said housing connector, whereby indication is provided to disconnect said cable and thereby remove electrical power from said removable plug to prevent accidental discharge of said first and second batteries by said plug contacting a conductive material during storage of the starting aid.

4,540,930

PLYWHEEL-POWERED MOBILE X-RAY APPARATUS

Melvin P. Siedband, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 12, 1983, Ser. No. 530,875
Int. Cl.[3] H05G *1/24*; H02K *7/02, 39/00*; H02P *9/12*
U.S. Cl. 322—4 **46 Claims**



1. A power supply for providing pulsed power to X-ray generating equipment comprising:

(a) a flywheel mounted for rotation;

(b) an electrical rotating machine having a rotor coupled by a shaft to the flywheel, a stator power winding, a rotor control winding, power terminals electrically coupled to the power winding and control terminals electrically coupled to the control winding;

(c) control power means connected to the control terminals of the electrical machine for supplying a selected control current to the control winding during operation of the electrical machine as a motor and for supplying a selected control current to the control winding when the machine is operated as a generator;

(d) motor drive means selectively connectable to the power terminals of the electrical machine for providing a varying electrical voltage to the power terminals at a frequency and phase selected to drive the rotor of the machine and the flywheel connected therewith; and

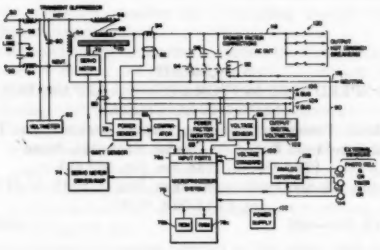
(e) motor-generator mode select switch means, connected to the power terminals of the electrical machine and to the output power of the motor drive means and having output lines, for responding to control signals to selectively connect the power terminals of the electrical machine to the motor drive means during a motor mode and for responding to a control signal to selectively disconnect the power terminals of the electrical machine from the motor drive means and to connect the power terminals to the output lines during a generator mode.

4,540,931

VARIABLE TRANSFORMER AND VOLTAGE CONTROL SYSTEM

Steven Hahn, East Hampton, N.Y., assignor to Regulation Technology, Inc., New York, N.Y.

Filed Jun. 24, 1983, Ser. No. 508,059
Int. Cl.[3] G05F *1/14*
U.S. Cl. 323—264 **30 Claims**



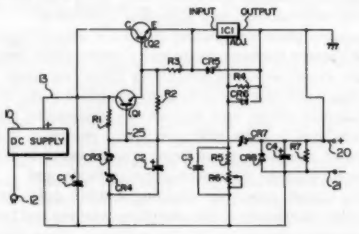
17. In a variable transformer having a movable core piece that moves past a pole face, the improvement comprising a controller for controlling the movement of said core piece so that said core piece moves at varying rates depending upon the position of said core piece with respect to said pole face.

4,540,932

TALK FILTERED POWER SUPPLY

David B. Oulton, Dollard des Ormeaux, Canada, assignor to Pylon Electronic Development Co., Ltd., Nepean, Canada

Filed Aug. 29, 1983, Ser. No. 527,365
Claims priority, application Canada, Sep. 16, 1982, 411556
Int. Cl.[3] G05F *1/46*
U.S. Cl. 323—266 **1 Claim**



1. A DC power supply comprising a pre-regulator having an

input connected to a DC supply, a control terminal connected to a reference voltage and an output connected to an input of a three terminal integrated circuit (IC) voltage regulator, said IC regulator having an output terminal for connection to a load and an adjustment terminal connected to a bias voltage, a zener diode being connected between said control terminal and the output of the IC regulator and between the input and output of the IC regulator, said zener diode having a breakdown voltage less than a maximum permissible input-output voltage differential for the IC regulator whereby an excessive load demand tending to increase the input voltage to the IC regulator causes the zener diode to conduct and reduce the voltage on the control terminal of the preregulator which thereupon decreases the voltage to the input of the IC regulator.

4,540,933

CIRCUIT FOR SIMULTANEOUS CUT-OFF OF TWO SERIES CONNECTED HIGH VOLTAGE POWER SWITCHES

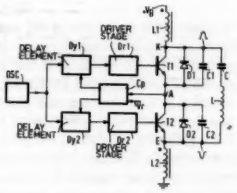
Dirk J. A. Teuling, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,264

Claims priority, application Netherlands, Nov. 10, 1982, 8204347

Int. Cl.³ H03K *17/28*

U.S. Cl. 323—271 **20 Claims**



8. A switching circuit comprising: a pair of terminals for connection to a source of high voltage, first and second high voltage semiconductor switches connected in series between said pair of terminals, control means for supplying a periodic switching control signal to respective control electrodes of the first and second semiconductor switches to drive the first and second switches from a saturation state to a cut-off state, said control means including first and second delay elements coupled to the control electrodes of the first and second semiconductor switches, respectively, for delaying a cut-off control signal supplied to the respective control electrodes, a comparison device having a first input coupled to a junction point between the first and second semiconductor switches and a second input coupled to a source of reference voltage, means coupling an output of the comparison device to at least one of said first and second delay elements for controlling the delay time of said one delay element as a function of the voltages appearing at said first and second inputs of the comparison device and in a manner so as to substantially simultaneously drive the first and second semiconductor switches from said saturation state to said cut-off state.

4,540,934

DEVICE FOR THE FINE ADJUSTMENT OF THE OUTPUT VOLTAGE OF MULTI-PHASE REGULATING TRANSFORMERS

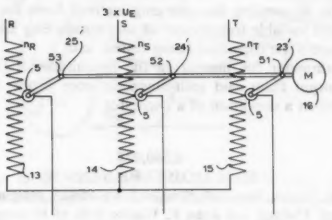
Egon Hübel, Feucht, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 7, 1983, Ser. No. 501,815

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3222264

Int. Cl.³ G05F *1/14*

U.S. Cl. 323—341 **4 Claims**



1. A device for fine adjustment of output voltage of a three-phase regulating transformer having a plurality of windings cooperating with assigned trolleys and common driving means for the trolleys, comprising coupling elements between respective trolleys and the driving means, said coupling elements having different play to introduce a dead travel exceeding the spacing between adjoining windings, of the driving means relative to at least one of the trolleys, and wherein one of the coupling elements has zero play and the second and the third coupling element have different plays to introduce different dead travels.

4,540,935

APPARATUS FOR IDENTIFYING DEFECTIVE ELECTRIC POWER DISTRIBUTION CAPACITORS

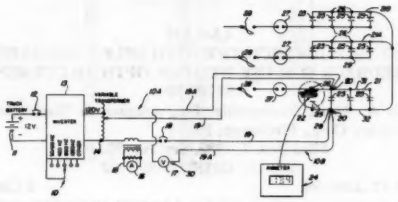
Merlin E. Burkum, Elmhurst, and Timothy M. O'Regan, Chicago, both of Ill., assignors to Commonwealth Edison Company, Chicago, Ill.

Continuation-in-part of Ser. No. 301,949, Sep. 14, 1981, Pat. No. 4,425,541. This application Jan. 3, 1984, Ser. No. 567,783

The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.

Int. Cl.³ G01R *31/08, 31/02*

U.S. Cl. 324—52 **22 Claims**



1. An apparatus for detecting incipient faults in a power capacitor having at least a phase terminal, including in combination:

an alternating current power source comprising a storage battery having an output of between 12 and 24 volts and an inverter having an input of between 12 and 24 volts D.C. and output of 120 volts at a frequency of about 60–800 hertz;

a variable transformer for varying the output voltage of the said power source, said variable transformer having an output from 0 to 480 volts;

connecting means for supplying alternating output voltage of said variable transformer to the power capacitor to be tested;

voltage detection means for setting and measuring a predetermined alternating voltage supplied by said connecting means at the terminals of the power capacitor thereby to provide setting and reading a voltmeter means in conjunction with the controls of said variable transformer;

an open and closed type, split-magnetic core probe means positioned about the phase terminal of the power capacitor for sensing the charging current from the output of said variable transformer of said connecting means which enters the capacitor being tested; and

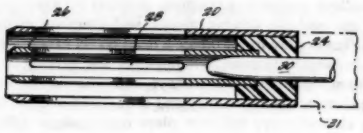
an ammeter for measuring the magnitude of the current output from said split-magnetic core probe to thereby detect a condition of a capacitor.

4,540,936

SOIL MOISTURE SENSOR

John E. Walsh, Box 264, Bradford, Vt. 05033, assignor to Dartmouth College and John E. Walsh, both of Hanover, N.H.

Filed Sep. 7, 1982, Ser. No. 416,232
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—61 P **14 Claims**



1. A moisture sensor for insertion into a moisture containing media comprising:

a base;

means extending outwardly from said base including first and second slotted tubes forming an effective coaxial capacitor defining adjacent extending surfaces partially bounding at least one volume containing said media when said sensor is inserted, said bounding surfaces providing an extending opening between said volume and the media therein and the media outside said sensor; and

circuit means connected to said means extending outwardly for applying an ac signal thereto to measure the impedance between said surfaces in the region where the opening extends and thereby the moisture content of said media.

4,540,937

ELECTRONIC CIRCUITRY WITH SELF-CALIBRATING FEEDBACK FOR USE WITH AN OPTICAL CURRENT SENSOR

Juris A. Asars, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 7, 1983, Ser. No. 502,026
Int. Cl.³ G01R *19/00, 1/02*
U.S. Cl. 324—96 **2 Claims**

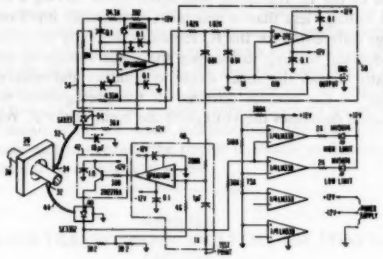
1. A magneto-optical electrical current measuring system, comprising:

a calibrated polarized light source, said light source being susceptible of low frequency variation in intensity;

magneto-optical electrical current sensor means disposed to measure electrical current in an electrical conductor by magnetically modulating the polarization angle of polarized light passed therethrough in response to changes in said current, said polarized light coming from said polarized light source;

circuit means connected to said magneto-optical electrical current sensing means for converting the modulated polarized light into a useful electric signal; and

low-pass filter means connected to the output of said circuit means for extracting therefrom that portion of said electric signal related to said low frequency variation in the intensity, the output of such low pass filter means being



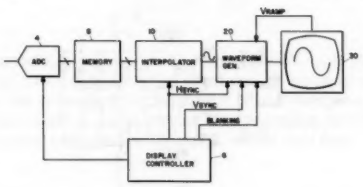
negatively fed back to said calibrated polarized light source for cooperating therewith to tend to reduce said low frequency variation in intensity to thus cause the intensity of said polarized light source to a constant value so that said modulated polarized light from said magneto-optical current sensor means tends to contain information only about said changes in said electric current.

4,540,938

DISPLAYING WAVEFORMS

Robert A. Bruce, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 21, 1983, Ser. No. 459,845
Int. Cl.³ G01R *13/20*
U.S. Cl. 324—121 R **12 Claims**



1. An apparatus for generating, from a voltage waveform which repeats at a predetermined rate, a video signal suitable to cause a representation of said waveform to be displayed on a raster scan display device having a display surface, means for producing a visible spot at the display surface, means for causing said spot to scan over said display surface in a rectangular raster scan pattern made up of a plurality of substantially rectilinear scan lines extending substantially parallel to one another in a predetermined direction, and means for varying the intensity of the spot, said apparatus comprising:

first means for forming an output signal representing the instantaneous difference between the voltage of the waveform and a voltage representing the position, in the raster scan pattern, of the scan line then being executed;

second means for receiving an input signal and producing, as an output signal, a clipped version thereof;

third means for receiving an input signal having voltage levels which are positive and negative with respect to a predetermined reference level and generating an output signal representing the absolute value thereof with respect to said reference level;

fourth means for receiving an input signal and producing, as an output signal, the inverse thereof;

fifth means for receiving an input signal including excursions from a given voltage level and producing an output signal in which the given voltage level is shiftable to a predetermined voltage level; and

sixth means for receiving an input signal including excursions of a given amplitude and producing an output signal in which the excursions are adjustable to a predetermined amplitude;

said second, third, fourth, fifth and sixth means being connected together so that the input signal received by one such means is the output signal provided by another such means, and being connected to the first means so that the output signal of the first means is the input signal of one of the second to sixth means.

4,540,939

APPARATUS FOR MONITORING CURRENT LEVELS IN AN A.C. TRANSMISSION LINE

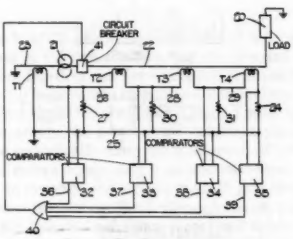
Colin T. Osborne, Tring, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Apr. 4, 1983, Ser. No. 482,036

Claims priority, application United Kingdom, Apr. 16, 1982, 8211160

Int. Cl.³ G01R *31/08*

U.S. Cl. 324—127 **8 Claims**



1. An apparatus for monitoring difference in current levels between adjacent zones of an a.c. transmission line comprising a plurality of current transformers responsive to current levels at a plurality of locations on said line, the secondary windings of said transformers being connected in a series circuit so that currents induced in said secondary windings are all in the same direction in said series circuit, a plurality of first resistances between a common connector of said series circuit and respective interconnections between said secondary windings of adjacent transformers, and means for detecting the voltages across said first resistances.

4,540,940

CIRCUIT TESTER FOR AUTOMOTIVE ELECTRICAL SYSTEMS

David C. Nolan, 2525 Virginia St., Omaha, Nebr. 68147

Filed Mar. 24, 1983, Ser. No. 478,323

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—133 **9 Claims**

1. A circuit tester for automotive electrical systems, comprising,

a body member having opposite ends and a grip portion therebetween,

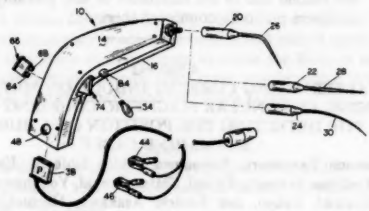
an electrical conductive probe extending from one end of said body member,

a pair of electrical leads secured to said body member, each of said leads being adapted to be operatively electrically connected to one of the terminals of the battery of the automobile,

an electric circuit in said body portion connecting said leads with said probe,

said circuit comprising a first lead member connected to and extending from one of said leads to said probe, said first lead member having a light series connected thereto; a second lead member connected to and extending from the other of said leads to said probe, said second lead member having a normally open, manually operated switch imposed therein which may be selectively closed to supply electrical current to said probe,

said light being illuminated when said switch is closed



whether or not said probe is in electrical contact with a portion of the automobile electrical system or components thereof,

said light being illuminated when said switch is open and said probe is in electrical contact with a portion of the automobile electrical system or a component thereof when electrical continuity to said portion or component exists.

4,540,941

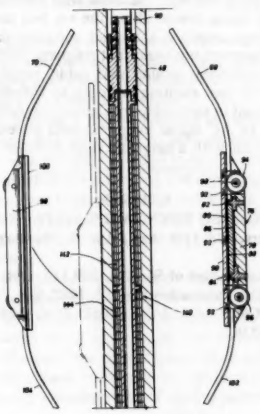
CASING COLLAR INDICATOR FOR OPERATION IN CENTRALIZED OR DECENTRALIZED POSITION

Arnold M. Walkow, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 12, 1983, Ser. No. 522,928

Int. Cl.³ G01N *27/72;* **G01R** *33/12;* **E21B** *17/10*

U.S. Cl. 324—221 **6 Claims**



1. Apparatus for indicating the location of joints in a string of magnetic tubular goods within a borehole, comprising:

an elongated body member adapted to traverse a string of tubular goods;

a first arm carrier member disposed on said body member;

a plurality of outwardly extending arm members equidistant about said body member and having a first end thereof pivotally connected to said first arm carrier member;

a pad member coupled to each one of said plurality of arm members;

a magnet for emitting a magnetic field mounted within each of said contact pad members;

a detector coil assembly for detecting the magnetic field from said magnets mounted within said body member;

a second arm carrier member disposed and longitudinally slidable on said body member and having a second end of one of said arm members pivotally connected thereto; and

a third arm carrier member disposed and longitudinally slidable on said second arm carrier member and having the second end of the remainder of said plurality of arm members pivotally connected thereto.

4,540,942

ALTERNATING CURRENT INDUCTION METHOD USING AN ANNULAR MAGNETIC COUPLING BODY FOR DETECTING THE POSITION OF A BURIED SUBMARINE CABLE

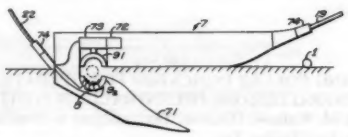
Kazuomi Yamamura, Yokohama; Hideo Ishihara, Kamakura; Yoshinao Iwamoto, Fujimi; Shizuo Suzuki, Yokohama; Yuichi Sirasaki, Tokyo, and Kenichi Asakawa, Hachiohji, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 282,876

Claims priority, application Japan, Jul. 16, 1980, 55-96252; Jul. 16, 1980, 55-96253

Int. Cl.³ G01V *3/11, 3/15;* **F16L** *1/04;* **H02G** *1/10*

U.S. Cl. 324—326 **1 Claim**



1. A method of detecting the position of a length of submarine cable buried beneath a sea bed, said cable being of the type having repeater casings connected to the cable to form a closed circuit, comprising: catching the cable with a first semi-annular magnetic body being towed along the sea bed and having an exciting winding, moving a second semi-annular magnetic body into engagement with said first magnetic body to form an annular magnetic body around said cable, supplying an AC signal current to said exciting winding to thereby induce an AC signal current in said cable by electro-magnetic induction, and detecting an AC signal magnetic field generated by said AC signal current with a magnetic field detector.

4,540,943

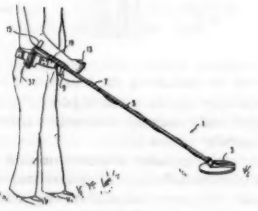
BELT-SUPPORTED SWINGABLE METAL DETECTOR

Oliver C. Akers, 618 11th Ave., Apt. 3, Huntington, W. Va. 25701

Continuation-in-part of Ser. No. 309,114, Oct. 6, 1981, abandoned. This application Sep. 15, 1982, Ser. No. 418,261

Int. Cl.³ G01V *3/11, 3/165;* **E05D** *7/10;* **A45F** *5/00*

U.S. Cl. 324—326 **5 Claims**



1. A swingable metal detector, comprising an elongated shaft, a detector head for sensing metal at one end of the shaft, a handle intermediate the length of the shaft, a belt worn by the user, means at the end of the shaft opposite the detector head for swingably mounting the shaft on the belt for horizontal swinging movement relative to the belt, and a bracket on the belt, said bracket having two different sockets for removably mounting the shaft on the belt, one said socket being on the side of the bracket which faces forwardly when the belt is worn with the bracket on one lateral side of the user's body so as removably to receive said mounting means when the shaft is disposed on one side of the user's body, and the other said socket being on the side of the bracket which faces forwardly when the belt is worn with the bracket in front of the user's body so as removably to receive said mounting means when the shaft is supported in front of the user's body.

4,540,944

METHOD OF CONVERTING PULSE FREQUENCY IN A CONTROL CIRCUIT OF A PULSE MOTOR

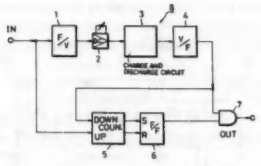
Masaki Watanabe, Nagoya, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Aichi, Japan

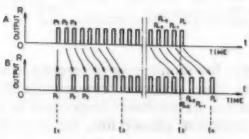
Filed Dec. 30, 1982, Ser. No. 454,579

Claims priority, application Japan, Apr. 8, 1982, 57-60212

Int. Cl.³ H03K *5/156*

U.S. Cl. 328—22 **6 Claims**





1. A method of converting pulse frequency in a control circuit of a pulse motor comprising: converting the constant frequency input of pulses into a voltage indicative thereof in a F/V converter, inputting such corresponding voltage to a charge and discharge circuit having a preset time constant, converting the output voltage from said charge and discharge circuit into output pulses having changing frequencies corresponding to changes in the voltage in a V/F converter, feeding such output pulses to the circuit output and stopping the output of such output pulses when the number of such input pulses becomes coincident with the number of such output pulses.

4,540,945

VARIABLE-FREQUENCY OSCILLATION CIRCUIT

Kazuo Kuroki, Tokyo, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 1, 1982, Ser. No. 413,720

Claims priority, application Japan, Sep. 3, 1981, 56-139110

Int. Cl.³ H03K *3/72;* **H03L** *7/18*

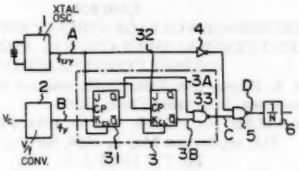
U.S. Cl. 328—134 **1 Claim**

1. A variable-frequency oscillator circuit comprising:

(a) a reference oscillator providing a reference pulse signal at a frequency fc;

(b) voltage-to-frequency converter means responsive to a control voltage for providing a control pulse signal at a frequency fv substantially lower than fc;

(c) first logic means responsive to the reference signal and the control signal for providing a first pulse signal having a frequency substantially equal to fv and a pulse width substantially equal to 1/fc and synchronized with the reference signal, the first logic means comprising first and second J-K flip-flops each having a clock input, J and K logic inputs, an asynchronous clear input, a nominal output and an inverted output, and a first two-input NAND gate, the clock inputs of the first and second flip-flops being connected to the reference oscillator for receiving the reference signal therefrom, the K and clear inputs of the first flip-flop being connected to the voltage-to-frequency converter means for receiving the control signal therefrom, the K and clear inputs of the second flip-flop being connected to the inverted output of the first flip-flop, the J inputs of the first and second flip-flops being operatively maintained at a "1" logic state, the first two-



input NAND gate being connected to receive the nominal output of the first flip-flop and the inverted output of the second flip-flop and providing the first pulse signal;

(d) second logic means responsive to the reference signal and the first signal for providing a second pulse signal which is substantially the same as the reference signal but with a pulse periodically removed at intervals of 1/fv, the second logic means comprising a second two-input NAND gate and an inverter, the second NAND gate being connected to the reference oscillator through the inverter for receiving the inverted reference signal and to the first NAND gate for receiving the first signal, and providing the second signal; and

(e) frequency divider means responsive to the second signal for dividing the frequency of the second signal by an integral amount to provide an output signal of a desired frequency.

4,540,946

VARIABLE CHARACTERISTIC FILTERS

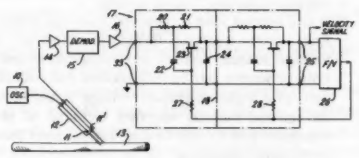
Antonio J. Sainz, Caracas, Venezuela, and Victor C. Roberts, London, England, assignors to National Research Development Corp., London, England

Continuation of Ser. No. 269,584, Jun. 2, 1981, abandoned. This application Dec. 22, 1983, Ser. No. 564,358

Claims priority, application United Kingdom, Jun. 6, 1980, 8018571

Int. Cl.³ H03B *1/00*

U.S. Cl. 328—167 **8 Claims**



1. Signal processing apparatus, comprising:

filter circuit means for filtering input signals within a fixed predetermined frequency range, said filter means having a variable low attenuation portion of said range delimited from a variable high attenuation portion of said range by a variable cut-off frequency, said cut-off frequency falling within said predetermined frequency range whenever signals of particular frequencies are applied to said filter means;

frequency analysis means for analysing signals within said predetermined frequency range applied to said filter circuit means and for providing an output signal responsive to the periodic frequency content of said applied signals; and

control means for automatically controlling said variable cut-off frequency in accordance with said output signal of said frequency analysis means to cause the filter to pass substantially all periodic filter input signals which occur within said predetermined frequency range.

4,540,947

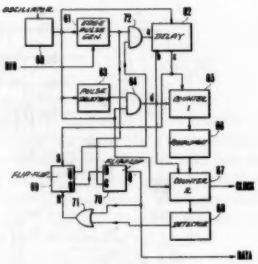
FM SIGNAL DEMODULATING APPARATUS

Akira Fujimoto, 12-17, Kamikizaki 5-Chome, Urawa City, Saitama Pref., Japan

Filed Jun. 22, 1983, Ser. No. 506,831

Int. Cl.³ H03D *3/00;* **H03K** *9/06*

U.S. Cl. 329—50 **1 Claim**



1. Apparatus for demodulating digital FM signals, comprising:

means for generating a train of successive clock pulses;

pulse deletion means, connected to said generating means, for deleting every third one of said successive clock pulses to produce post-deletion pulses;

edge pulse generator means, adapted to receive said digital FM signals and connected to said generating means, for generating a plurality of edge pulses in accordance with the rise and fall of said digital FM signal, said edge pulses including data edge pulses and clock edge pulses;

means for delaying each one of said clock edge pulses by a predetermined period of time to produce delayed clock edge pulses;

first counter means, connected to said delay means and to said pulse deletion means, for counting said post-deletion pulses, said counting begins synchronously with one of said delayed clock edge pulses and terminates upon the arrival of a next one of said clock edge pulses;

complement means, connected to said first counter means, for forming complements of said counted post-deletion pulses;

second counter means, connected to said generating means and to said delay means and to said complement means, for counting by "1's" and "0's" said complements in accordance with said successive clock pulses,

detection means, connected to said second counter means, for detecting a state where said second counter means contains all "1's";

first flip-flop means, connected to said delay means for defining a beginning and a termination of a mask which synchronizes FM demodulation, said mask beginning is initiated when said first flip-flop means is set by one of said

clock edge pulses, said mask is terminated when said first flip-flop means is reset;

second flip-flop means, connected to said first flip-flop means and to said edge pulse generator means and to said detector means, for providing the demodulated digital output and for generating a signal to reset said first flip-flop means synchronously with one of said data edge pulses obtained during a period when said first flip-flop means is set and when said detector means detects all "1's" and;

gate means, connected to said first flip-flop means and to said edge pulse generator means and to said delay means for, providing only the edge pulses corresponding to clock edge pulses to said delay means.

4,540,948

8-PHASE PHASE-SHIFT KEYING DEMODULATOR

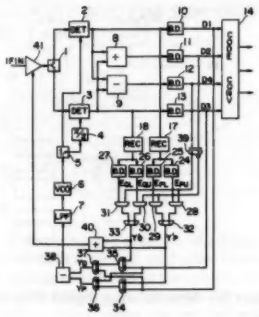
Toshihiko Ryu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,787

Claims priority, application Japan, Sep. 14, 1982, 57-161420; Dec. 9, 1982, 57-216524

Int. Cl.[3] H03D *3/02*

U.S. Cl. 329—122 **12 Claims**



1. An 8-phase phase-shift keying demodulator for demodulating an 8-phase phase-modulated signal applied thereto, said demodulator including:

a voltage-controlled oscillator (**6**) controlled by an automatic phase control signal for carrier recovery;

a first phase detector (**2**) supplied with said phase-modulated signal for coherent detection thereof using the output of said voltage-controlled oscillator;

a second phase detector (**3**) supplied with said phase-modulated signal for coherent detection thereof using the $\pi/2$-radian phase-shifted output of said voltage-controlled oscillator;

an adder (**8**) for adding the outputs of said first and second phase detector;

a subtractor (**9**) for making subtraction of the outputs of said first and second phase detector;

first through fourth binary decision circuits (**10**), (**11**), (**12**), and (**13**) coupled to said first phase detector, said adder, said subtractor, and said second phase detector, respectively, and generating binary signals D1, D2, D3, and D4, respectively;

a code converter (**14**) for receiving said binary signals D1, D2, D3, and D4 and generating code-converted outputs, wherein the improvement comprises:

a first means receiving the outputs of said first and second detector, generating error signals E_{PL} and E_{PU} which are components in the direction of the X coordinate axis on a phase plane and also generating error signals E_{QU} and E_{QL} which are components in the direction of the Y coordinate axis on said phase plane;

a second means receiving the signals E_{PU}, E_{PL}, E_{QU}, E_{QL}, D2, and D4, and generating error signals $Y_{P'}$ and $Y_{Q'}$ according to the signals received;

a third means receiving said error signals $Y_{P'}$, $Y_{Q'}$, D1 and D3 and generating error signals Y_P and Y_Q; and

a control signal generator which makes subtraction of said error signals Y_P and Y_Q for producing said automatic phase control signal; in which the signals $Y_{P'}$, $Y_{Q'}$, Y_P, and Y_Q satisfy the following logic equations,

$$Y_{P'}=E_{PU}\cdot(D2\oplus D4)+E_{PL}\cdot(D2\oplus D4)$$

$$Y_{Q'}=E_{QU}\cdot(D2\oplus D4)+E_{QL}\cdot(D2\oplus D4)$$

$$Y_P=Y_{P'}\oplus D1\oplus D3$$

$$Y_Q=Y_{Q'}\oplus D1\oplus D3.$$

4,540,949

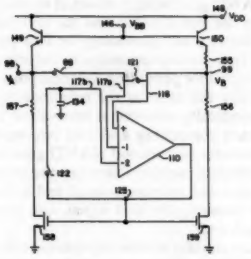
REFERENCE VOLTAGE CIRCUIT INCLUDING A THREE-TERMINAL OPERATIONAL AMPLIFIER WITH OFFSET COMPENSATION

Yusuf A. Haque, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Division of Ser. No. 292,968, Aug. 14, 1981, Pat. No. 4,460,874. This application May 2, 1984, Ser. No. 584,655

Int. Cl.[3] H03F *1/36, 1/02*

U.S. Cl. 330—85 **4 Claims**



1. A voltage reference circuit comprising:

an input reference voltage terminal receiving an input reference voltage having a level determined by a bias voltage source;

an output reference voltage terminal providing an output reference voltage having a level maintained equal to said input reference voltage;

an operational amplifier having a noninverting input terminal, an output terminal and a first and a second inverting input terminal, said second inverting input terminal receiving a voltage which causes the output voltage of said operational amplifier to be zero when the voltage on said first inverting input terminal is equal to the voltage on said noninverting input terminal; and

a voltage adjusting circuit having:

first and second load transistors, said load transistors having first current carrying terminals connected to a positive voltage source, control terminals connected to said bias voltage source, and having second current carrying terminals, said input reference voltage terminal connected to the second current carrying terminal of said first load transistor and to said first inverting input terminal of said operational amplifier;

voltage divider means, the divided voltage from said voltage divider means being applied to said output reference voltage terminal and to said noninverting input terminal of said operational amplifier;

offset voltage storage means for storing the offset voltage of said operational amplifier obtained at said output terminal

of said operational amplifier when the voltage on said noninverting input terminal is held equal to the voltage on said first inverting input terminal, and for providing said offset voltage to said second inverting input terminal; and

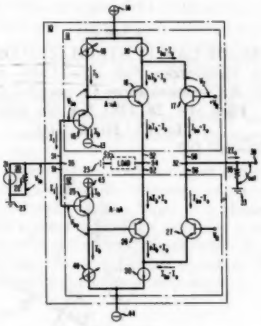
output voltage adjusting means comprising a first output voltage adjusting transistor having its first current carrying terminal connected to the second current carrying terminal of said first load transistor and its second current carrying terminal connected to a negative voltage source, a second output voltage adjusting transistor having its first current carrying terminal connected through said voltage divider means to the second current carrying terminal of said second load transistor and its second current carrying terminal connected to said negative voltage source, said first and second output voltage adjusting transistors having their control terminals connected to the output terminal of said operational amplifier.

4,540,950

WIDEBAND LINEAR AMPLIFIER

David G. Ross, Fair Haven, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 7, 1982, Ser. No. 385,557
Int. Cl.³ H03F *3/30*
U.S. Cl. 330—267 **5 Claims**



2. A linear amplifier circuit comprising

means for receiving input signals;

a first transistor of a first conductivity type arranged in a common-collector configuration;

a second transistor of a second conductivity type arranged in a common-emitter configuration;

a third transistor of the first conductivity type arranged in a common-base configuration;

means connecting the receiving means to an input of the first transistor for coupling input signals to the first transistor;

means connecting an output of the first transistor to an input of the second transistor for coupling signals to the second transistor;

means connecting an output of the second transistor to an input of the third transistor for coupling signals to the third transistor; and

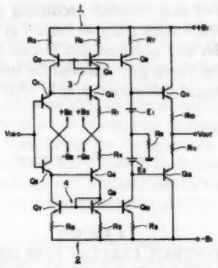
means connect with an output of the third transistor for transmitting output signals.

4,540,951

AMPLIFIER CIRCUIT

Akio Ozawa; Susumu Sueyoshi; Keishi Sato; Kikuo Ishikawa; Kiyomi Yatsuhashi; Satoshi Ishii, and Masamichi Yumino, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 188,792, Sep. 19, 1980, Pat. No. 4,433,305.
This application Oct. 27, 1983, Ser. No. 523,258
Claims priority, application Japan, Sep. 21, 1979, 54-121646; Sep. 21, 1979, 54-121649
Int. Cl.³ H03F *3/26*
U.S. Cl. 330—267 **10 Claims**



1. A push-pull amplifier circuit, comprising:

first amplifying means including a first transistor having a base to which an input signal is applied, a second transistor having a base to which an output of said first transistor is applied, said second transistor being opposite in conductivity type to said first transistor, and means for supplying currents to said first and second transistors, the ratio of said currents being constant; and

second amplifying means including a third transistor having a base to which said input signal is applied, a fourth transistor having a base to which an output of said third transistor is applied, said fourth transistor being opposite in conductivity type to said third transistor, and means for supplying currents to said third and fourth transistors, respectively, the ratio of said currents being constant;

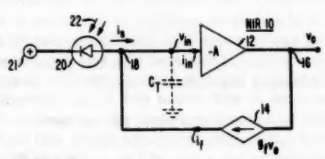
a load coupled to be driven by the current flowing through said first and third transistors or the current flowing through said second and fourth transistors.

4,540,952

NONINTEGRATING RECEIVER

Gareth F. Williams, Summit, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 8, 1981, Ser. No. 300,376
Int. Cl.³ H03G *3/20*
U.S. Cl. 330—279 **58 Claims**



1. A nonintegrating receiver (FIG. 9), having an input capacitance C_T, for amplifying a signal current i_s having a bandwidth Δf comprising:

an input terminal to which said signal current is applied and an output terminal at which an amplified output voltage v_o appears,

a voltage amplifier connected between said terminals, said amplifier having a forward voltage gain (A) with n ($n=1,2\ldots$) poles therein at frequencies f_{ai} ($i=1,2,\ldots n$) outside said bandwidth, and

a negative feedback circuit, connected between said terminals, including a current source for generating a feedback current i_f which is proportional to v_o and which is subtracted from i_i at said input terminal, the transconductance g_f of said current source being essentially independent of frequency within said bandwidth and being of opposite sign to the forward gain A,

said feedback circuit in combination with the input capacitance C_T of said receiver producing a feedback voltage gain β with a feedback pole therein at a frequency f_f, and

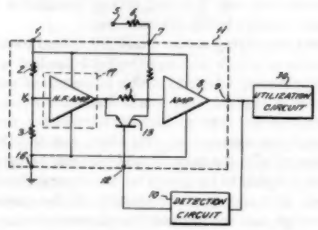
said amplifier and said feedback circuit forming a loop circuit having a loop gain $A\beta$, and for stability said feedback pole f_f being the dominant pole in $|A\beta|$ versus frequency.

4,540,953

GAIN CONTROL CIRCUIT FOR OBTAINING A CONSTANT OUTPUT SIGNAL AMPLITUDE BY ATTENUATING AN INPUT SIGNAL AMPLITUDE

Hisashi Togari, and Shinji Miyata, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Japan

Filed Feb. 28, 1983, Ser. No. 470,131
Claims priority, application Japan, Feb. 26, 1982, 57-30329
Int. Cl.³ H03G *3/20*
U.S. Cl. 330—284 **9 Claims**



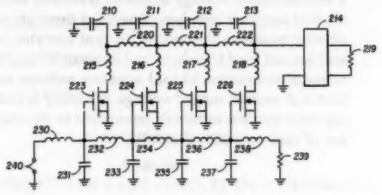
1. A gain control circuit comprising: a signal amplifier having an input terminal and amplifying an input signal supplied to said input terminal; variable impedance means having a first terminal coupled to said input terminal of said signal amplifier, a second terminal, and a control terminal, an impedance between said first and second terminals of said variable impedance means being varied in response to a gain control signal supplied to said control terminal; means responsive to an output signal of said signal amplifier for producing said gain control signal; a reference voltage generation means for generating a reference voltage at its output end, said output end having a first impedance; a negative feedback amplifier having an input end connected to said output end of said reference voltage generation means and an output end coupled to the second terminal of said variable impedance means, said negative feedback amplifier having a gain of 1 to produce at its output end a bias voltage that is substantially equal to said reference voltage, said output end of said negative feedback amplifier having an impedance which is lower than said first impedance of said output end of said reference voltage generating means; and a bias voltage supplying means coupled between the output end of said negative feedback amplifier and the input terminal of said signal amplifier.

4,540,954

SINGLY TERMINATED DISTRIBUTED AMPLIFIER

Thomas R. Apel, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 24, 1982, Ser. No. 444,290
The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.
Int. Cl.³ H03F *3/60*
U.S. Cl. 330—286 **12 Claims**



1. An integrated circuit comprising:

a. a plurality of amplifying means for amplifying an input signal and mounted on a semiconductor substrate; and

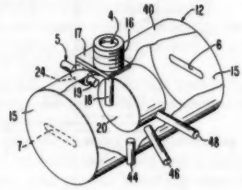
b. means for interconnection of said amplifying means, each to the others, to form an amplification stage, said means for interconnection having a dissimilar susceptance and reactance for each connection from the susceptance and reactance of the other connection means, the dissimilarity a function of the total number of amplifying means in said stage and resulting in substantially all of the output of said amplifying means being provided to a singly terminated output.

4,540,955

DUAL MODE CAVITY STABILIZED OSCILLATOR

Slawomir J. Fiedziuszko, Palo Alto, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Mar. 28, 1983, Ser. No. 480,184
Int. Cl.³ H03B *5/00*
U.S. Cl. 331—107 DP **5 Claims**



1. An electromagnetic oscillator having an output conveying a stable a.c. waveform, comprising:

a cavity having at least three ports and having electrically conductive walls, within which resonate first and second orthogonal modes of electromagnetic energy; and

an amplifying element having an input and an output;

wherein the output of the amplifying element is excitationally coupled to the first orthogonal mode at a first port of the cavity;

at a second port of the cavity, the second orthogonal mode is coupled to the input of the amplifying element;

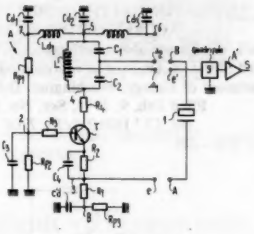
at a third port of the cavity, the first orthogonal mode is coupled to the output of the oscillator; and

a stable a.c. reference is injected into the cavity at a fourth port thereof, the electrical field vector of the stable a.c. reference being aligned with a characterizing vector of the second orthogonal mode.

4,540,956
HIGH FREQUENCY BAND-PASS AMPLIFIER WITH ADJUSTABLE IMPEDANCE AND OSCILLATOR INCLUDING IT

Jacques Chauvin, Sartrouville, and Roger Molle, Le Kremlin-Bicetre, both of France, assignors to Compagnie d'electronique et de Piezo-Electricite C.E.P.E., Argenteuil, France

Filed Mar. 19, 1984, Ser. No. 590,643
Claims priority, application France, Mar. 18, 1983, 83 04485
Int. Cl.³ H03B *5/36*
U.S. Cl. 331—116 R **12 Claims**



1. An oscillator comprising:

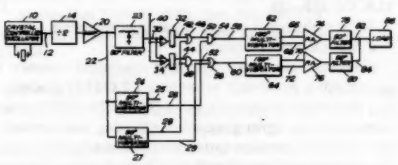
a high frequency band-pass amplifier with adjustable impedance, said amplifier comprising a transistor connected in common base and having an emitter loaded by a resistive divider bridge including a first resistor connected to ground and to a point called the mid-point of the resistive divider bridge, connected in series with a second resistor connected to said mid-point and to the emitter of the transistor, said mid-point of the resistive divider bridge forming the input of the amplifier, said transister having a collector loaded by a parallel LC circuit one end of which is connected to a power supply voltage and having one inductive side and one capacitive side (c), two points, called the midpoints, of the inductive side (L) and or the capacitive side, respectively, (C) forming the outputs of the amplifier said transistor having a base biased by a DC supply voltage and connected to ground via a capacitor ensuring common base operation in the pass-band of the amplifier; and,

a resonator connected between the input and one output of the amplifier, wherein the frequency of resonance (f_O) of the parallel circuit (LC) is equal to a chosen frequency (f_O) of the resonator, and the amplifier is adjusted such that the open loop transfer function fulfills the Berkhausen conditions only for the resonance peak of the resonator corresponding to the chosen frequency (f_O).

4,540,957
AMPLITUDE MODULATOR FORMS TWO PHASE-SHIFTED PULSE TRAINS AND COMBINES THEM

George D. Hanna, Dallas, Tex., assignor to Continental Electronics Mfg. Co., Dallas, Tex.

Filed May 6, 1983, Ser. No. 492,305
Int. Cl.³ H03K *7/08;* **H03C** *1/50, 1/01*
U.S. Cl. 332—10 **9 Claims**



1. A system for producing an amplitude modulated sinusoidal signal of carrier frequency whose voltage amplitude varies linearly with variations in the voltage level of a varying voltage level modulating signal, comprising:

(a) first signal generating means for generating a rectangular wave voltage signal having said carrier frequency;

(b) first filter means connected to said first signal generating means for extracting the fundamental signal component from said rectangular wave voltage signal, whereby the output of said first filter means is a sinusoidal wave voltage signal having said carrier frequency;

(c) comparator means connected to receive said filter means output and said modulating signal for continuously comparing their respective instantaneous voltage levels and, whenever a condition exists that the instantaneous voltage level of said filter means output exceeds that of said modulating signal, producing a unipolar rectangular pulse and its complement, each of duration equal to the duration of said condition, whereby said comparator means outputs first and second trains of unipolar rectangular pulses with the second train being the complement of the first and with the widths of the pulses in each train being variable in dependence upon the instantaneous voltage level relationship of said filter means output with said modulating signal;

(d) first multivibrator means coupled to said comparator means and responsive to said first train of variable width unipolar rectangular pulses for forming a first train of constant width unipolar rectangular pulses and its complement, each constant width pulse thereof starting with the start of a respective first train variable width pulse and ending 180° later therefrom;

(e) second multivibrator means coupled to said comparator means and responsive to said second train of variable width unipolar rectangular pulses for forming a second train of constant width unipolar rectangular pulses and its complement, each constant width pulse thereof starting with the end of a respective second train variable width pulse and ending 180° later therefrom, the respective 180° wide pulses of the first and second trains overlapping to define a first of two resultant signal waveforms, while those of the complements of said first and second trains overlap to define the second resultant signal waveform;

(f) second filter means for extracting the fundamental signal component from each of said resultant signal waveforms thereby to provide respective sinusoidal wave voltage signal outputs having said carrier frequency; and

(g) means for adding vectorially said outputs of said second filter means whereby, as the varying voltage level modulating signal is varied from a voltage amplitude of 0 of the sinusoidal wave voltage signal of carrier frequency outputted by said first filter means to the peak voltage amplitude of said carrier frequency voltage signal, said amplitude modulated sinusoidal signal of carrier frequency will be formed whose voltage amplitude varies linearly with variations in the voltage level of said modulating signal.

4,540,958
ZERO IF FREQUENCY-MODULATOR

Edward J. Neyens, and John G. Vaal, both of Ft. Wayne, Ind., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 30, 1983, Ser. No. 538,045
Int. Cl.³ H03C *3/00*
U.S. Cl. 332—16 R **21 Claims**

1. An arrangement for frequency-modulating telecommunication carriers with baseband signals, comprising

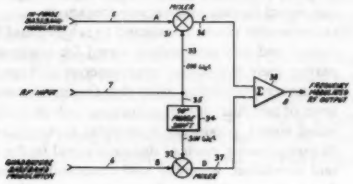
means for generating two quadrature-related baseband signals in two separate channels, said quadrature-related baseband signals being respective in-phase and quadrature sinusoidal functions of the instantaneous angle of a message signal to be transmitted; and

means for producing a frequency-modulated carrier from said quadrature-related baseband signals, including

means for providing two quadrature-related carrier-frequency waveforms,

means for individually mixing one of said quadrature-related carrier-frequency waveforms with one of said quadrature-related baseband signals in one of said channels and the other carrier-frequency waveform with the other of said baseband signals in the other channel to form respective first and second signals in said one and other channels, and

means for combining said first and second signals from said channels into a single frequency-modulated carrier-frequency output signal.



4,540,959

RECTANGULAR TO ELLIPTICAL WAVEGUIDE CONNECTION

Saad S. Saad, Willowbrook, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed Nov. 22, 1983, Ser. No. 554,178
Int. Cl.[3] H01P *1/16, 5/08*
U.S. Cl. 333—21 R **5 Claims**

1. A waveguide connection comprising the combination of a rectangular waveguide,

an elliptical waveguide having a cutoff frequency and impedance different from those of said rectangular waveguide,

an inhomogeneous stepped transformer joining said rectangular waveguide to said elliptical waveguide, said transformer having multiple sections all of which have inside dimensions small enough to cut off the first excitable higher order mode in a preselected frequency band,

each section of said transformer having an elongated transverse cross section which is symmetrical about mutually perpendicular transverse axes which are common to those of said rectangular and elliptical waveguides, and

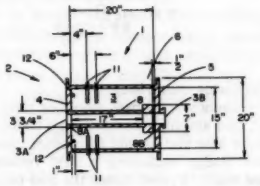
the inside dimensions of said elongated transverse cross section increasing progressively from step to step in all four quadrants along the length of the transformer and at each step in the transformer, in the direction of both of said transverse axes, so that both the cutoff frequency and the impedance of said transformer vary monotonically along the length of said transformer.

4,540,960

MONOCHROMATIC RADIO FREQUENCY ACCELERATING CAVITY

Salvatore Giordano, Port Jefferson, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 9, 1984, Ser. No. 578,406
Int. Cl.[3] H01P *1/16, 7/04, 7/06*
U.S. Cl. 333—228 **12 Claims**



1. A radio frequency resonance cavity that supports a fundamental resonant frequency and that is free of spurious modes, comprising, wall means defining a resonant cavity having inlet and outlet apertures and further defining a chamber around a predetermined portion of said resonant cavity, said wall means still further defining passageways through the radially inner wall of said chamber for enabling spurious modes to extend from the cavity through the passageways and into the chamber, lossy material disposed in said chamber for damping said spurious modes, and a plurality of rods mounted at random loci on the inner walls of said cavity thereby to dispose the rods to extend into the cavity where they perturb all remaining spurious modes and cause there fields to excite said chamber and be damped therein by said lossy material, whereby electro-magnetic energy having a fundamental resonant frequency equal to that of the cavity can enter the cavity through said inlet aperture and leave the cavity through said oulet aperture without being substantially affected by spurious modes.

4,540,961

MOLDED CASE CIRCUIT BREAKER WITH AN APERTURED MOLDED CROSS BAR FOR SUPPORTING A MOVABLE ELECTRICAL CONTACT ARM

Alfred E. Maier, Chippewa, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 19, 1983, Ser. No. 562,647
Int. Cl.[3] H01H *77/02*
U.S. Cl. 335—16 **15 Claims**

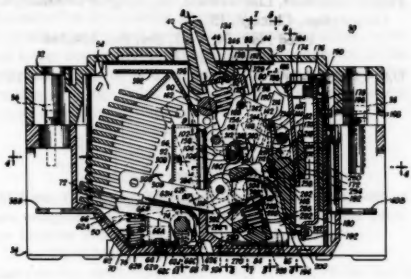
14. An electrical circuit breaker comprising:

a first electrical contact;

a second elongated movable electrical contact rotatable about a pivot axis between a CLOSED position contacting said first contact and a BLOWN-OPEN position; and

compression spring means for biasing said second contact, said compression spring means exerting a biasing force on said second contact along a line of action disposed on one side of said pivot axis to bias said second contact in said

CLOSED position and exerting a biasing force on said second contact along a line of action disposed on said one side of said pivot axis to retain said second contact in said BLOWN-OPEN position.



4,540,962

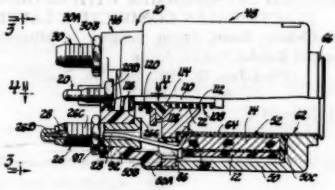
SOLENOID COIL WIRE TERMINATION

Ross A. Gresley; Howard E. Leech, both of Anderson, and Alan L. Smock, Dubois, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 29, 1984, Ser. No. 614,753

Int. Cl.³ H01H *51/08*

U.S. Cl. 335—131 **5 Claims**



1. A terminal and fixed electrical contact for a solenoid switch comprising, a housing formed of insulating material, a metallic terminal member supported by and extending through said housing, said terminal member having an internal axially extending bore, a solenoid coil winding comprising a terminating conductor located within said bore, said conductor being electrically connected to said terminal member at an end thereof that is located at one side of said housing, the opposite end of said terminal member being located at an opposite side of said housing and having a portion disposed at least partially around an end of said bore that forms a fixed electrical switch contact face that is adapted to be engaged by a movable electrical contact.

4,540,963

RELAY WITH BRIDGE CONTACT SPRING

Robert Esterl, Reinstorf, and Josef Weiser, Hohenschaftlarn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

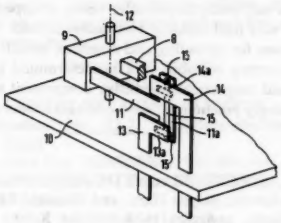
Continuation of Ser. No. 505,344, Jun. 17, 1983,. This application Nov. 8, 1984, Ser. No. 669,726

Claims priority, application Fed. Rep. of Germany, Jun. 30 1982, 3223468

Int. Cl.³ H01H *63/02*

U.S. Cl. 335—133 **13 Claims**

1. An electrical relay assembly comprising an excitation coil means, an armature movable by operation of said excitation coil means, and a stationary counter contact means with two spaced-apart counter contact elements disposed in a plane, and a bridge contact means for controllably electrically bridging said counter contact elements in response to movement of said armature in one direction having a longitudinal first section fixed at one end of said armature and connected at the opposed end with a linearly directed second section, said second section having two contact points respectively disposed opposite said counter contact elements and offset from the longitudinal axis of said first section and said first section having a lateral width not greater than half the distance between said contact points



such that said bridge contact means exhibits a first spring lever action along said first section and a second spring lever action along said second section when bridging said counter contact elements, wherein said second section is connected to said first section by an intermediate section laterally directed relative to said first section and the linear axis of said second section is substantially parallel to the longitudinal axis of said first section.

4,540,964

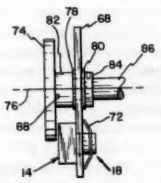
MAGNETIC SWITCH APPARATUS

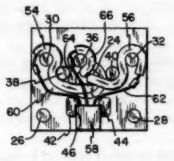
William F. Bleeke, Fort Wayne, Ind., assignor to Xolox Corporation, Fort Wayne, Ind.

Filed May 29, 1984, Ser. No. 615,048

Int. Cl.³ H01H *36/00*

U.S. Cl. 335—205 **12 Claims**





1. Magnetic switch apparatus comprising:

a magnetically sensitive component, having electrical leads extending therefrom;

a casing which includes a supporting plate of non-magnetic material, having the magnetically sensitive component securely positioned therein;

first means for positioning the magnetically sensitive component in a predetermined location, including component-

locating embossments on said supporting plate which receives and holds said component against movement in at least one direction;

second means for locating and holding said leads against movement thereof upon application of a tensile force thereto, including lead-locating embossments on said supporting plate about which said leads, respectively, are partially wrapped;

a lead-receiving aperture, formed in said plate, through which said leads extend after being wrapped as aforesaid about said lead-locating embossments; and

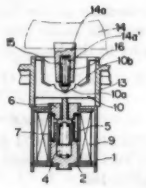
third means for mounting said magnetic switch apparatus on a supporting member in a predetermined position such that said magnetically sensitive component will be correspondingly positioned relative to said supporting member.

4,540,965

ELECTROMAGNETIC ASSEMBLY

Masaichi Hattori; Shigeo Hara, and Shunichi Manabe, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Feb. 29, 1984, Ser. No. 584,763
Claims priority, application Japan, Mar. 2, 1983, 58-032904
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—259 **20 Claims**



1. An electromagnetic assembly operable at two energization levels, comprising:

(a) affixed position core means;

(b) coil means disposed about said core means and including means connecting said coil means to a source of electricity for energizing said coil means and thereby generating a magnetic circuit;

(c) a first magnetically movable member associated with said core means so as to be positioned in said circuit when said coil is energized and said first member movable between a first and a second position;

(d) a second magnetically movable member associated with said first member so as to be positioned in said circuit when said coil is energized and said second member movable between a first and a second position;

(e) first resilient means bearing against said first member for urging said first member from said first to said second position;

(f) second resilient means bearing against said second member for urging said second member from said first to said second position and said second resilient means exerts a force greater than the force exerted by said first resilient means;

(g) said second member spaced from said first member when said second member is in said second position and said first member is in said first position; and,

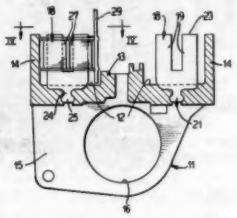
(h) retaining means operably associated with said first member for maintaining said first member in said first position when said coil means is not energized whereby energization of said coil means to a preselected first level causes said first member to move from said first to said second position and to thereby engage said second member and subsequent energization of said coil means to a preselected second level greater than the first level causes said engaged first and second members to move from said second to said first positions.

4,540,966

MULTIPLE MAGNET CORE UNIT

Phillip Zelkowitz, Lincolnwood, Ill., assignor to Albany-Chicago Corporation, Chicago, Ill.

Filed Nov. 24, 1982, Ser. No. 444,346
Int. Cl.³ H01F *3/00*
U.S. Cl. 335—297 **11 Claims**



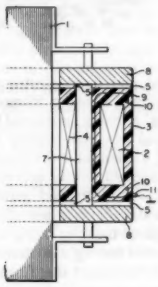
1. A multiple magnet core unit for relays of teleprinters and the like which comprises a non-magnetic cast metal frame having an elongated platform, a row of upstanding magnetic metal core fingers transversely spaced along the length of the platform having integral depending portions cast in-situ in the frame directly surrounded by and intimate with the frame metal and said portions fixedly positioning said fingers to present free ends at precise locations relative to the frame.

4,540,967

MOLDED TRANSFORMER WITH GROUNDED ELECTRICALLY CONDUCTIVE LAYER

Takashi Chitose, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1982, Ser. No. 393,087
Int. Cl.³ H01F *15/04*
U.S. Cl. 336—84 C **1 Claim**



1. A molded transformer comprising:

a core;

an inner low-voltage coil and an outer high-voltage coil wound around said core;

winding support members fixing said inner low-voltage coil and said outer high-voltage coil to said core;

an insulating layer formed of cast resin enclosing said outer high-voltage coil; and

a tubular, electrically conductive layer buried in said insulating layer;

said outer high-voltage coil having an upper end face and a lower end face at respective opposite ends of said outer high-voltage coil, and an inner periphery between said upper and lower end faces facing said inner low-voltage coil;

upper and lower end parts of said tubular conductive layer being bent outward so as to oppose said upper and lower end faces of said outer high-voltage coil, respectively;

a vertically extending body part of said tubular conductive layer being opposed to said inner periphery of said outer high-voltage coil;

said conductive layer being grounded;

said transformer further comprising means, including upper and lower conductive rings respectively connected to the outermost ends of said upper and lower end parts, for limiting electric fields crowding, thereby to prevent cracks in said insulating layer.

4,540,968

OPEN FUSE CUTOUT

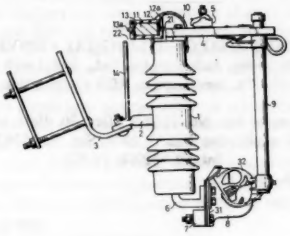
Kazuaki Kato, Chita, and Tomio Washizu, Ichinomiya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya and Takamatsu Electric Works, Ltd., Inuyama, both of, Japan

Filed May 1, 1984, Ser. No. 605,942

Claims priority, application Japan, May 7, 1983, 58-68175[U]

Int. Cl.³ H01H *71/10*

U.S. Cl. 337—31 **7 Claims**



1. An open fuse cutout comprising:

(a) a mounting member;

(b) a supporting insulator supported on said mounting member;

(c) first and second electrodes mounted on said supporting insulator;

(d) a fuse tube extending between and supported on said first and second electrodes;

(e) a protective cap fixed to an end of said supporting insulator;

(f) a grounding member attached to said mounting member;

(g) a lightning arrester element disposed in said protective cap and defining a first charging electrode and a grounding electrode, said charging electrode and said first electrode forming a first confronting pair and said grounding electrode and said grounding member forming a second confronting pair; and

(h) at least one of said first and second confronting pairs having a spark gap.

4,540,969

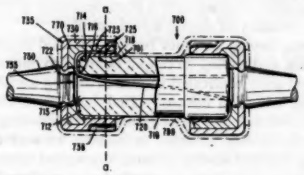
SURFACE-METALIZED, BONDED FUSE WITH MECHANICALLY-STABILIZED END CAPS

Joseph Sugar, Los Angeles, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Aug. 23, 1983, Ser. No. 525,759

Int. Cl.³ H01H *85/16*

U.S. Cl. 337—232 **42 Claims**



1. An electrical fuse comprising:

(A) an elongated body defining an elongated conduit therethrough and having first and second external connective portions;

(B) surface metalization applied to said connective portions; and

(C) a fusible element having third and fourth connective portions, said third and fourth portions being respectively welded to the surface metalization of said first and second portions and including a central section disposed in said conduit and,

(D) first and second end cap assemblies, respectively mounted on said fusible element and said first and second connective portions.

4,540,970

CIRCUIT BREAKING ELEMENT

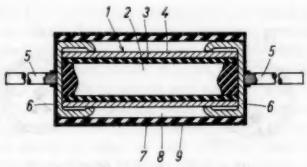
Mikizo Kasamatsu, No. 22-7, Korikitano-choNeyagawa-shi, Osaka-fu, Japan

Filed Feb. 29, 1984, Ser. No. 584,934

Claims priority, application Japan, Dec. 29, 1982, 57-234362; Mar. 4, 1983, 58-36443

Int. Cl.³ H01H *85/04*

U.S. Cl. 337—297 **3 Claims**



1. A fuse comprising a circuit breaking element comprising an electrically insulating tubular base member, an organic insulation layer having a low melting point and formed over the surface of the tubular base member, and a metal resistance coating layer formed over the surface of the insulation layer, electrically conductive caps each connected to a lead wire fixedly fitted over opposite ends of said circuit breaking element so as to contact said metal resistance coating layer and electrically interconnect it to the lead wires, the resulting assembly being fixedly enclosed in an electrically insulating cover so that a clearance is formed between the cover and the metal resistance coating layer of said circuit breaking element.

4,540,971

METAL OXIDE VARISTOR MADE BY A CO-PRECIPATION PROCESS AND FREEZE-DRIED

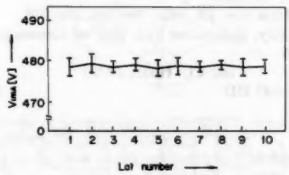
Hideyuki Kanai, Kawasaki; Takashi Takahashi, Tokyo; Motomasa Imai, Inagi; Osamu Furukawa, Sagamihara; Hiroshi Endo, Yokohama; Osamu Hirao, Tokyo, and Masaru Hayashi, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 22, 1983, Ser. No. 506,768

Claims priority, application Japan, Jun. 25, 1982, 57-108309

Int. Cl.³ H01C *7/10*; H01B *1/08*

U.S. Cl. 338—21 **12 Claims**



1. A metal oxide varistor comprising a component of grain bodies comprised of zinc oxide and a component of grain

boundary layers comprised of at least one metallic oxide containing metal other than zinc, wherein at least a portion of at least one of said zinc oxide and said metallic oxide comprises a fine particle powder prepared by a co-precipitation method consisting essentially of the steps of

(a) preparing an aqueous solution comprising at least two metal ions;

(b) by adding a base, forming a co-precipitate comprising substantially all of said metal ions in the form of corresponding metallic oxides; and thereafter

(c) carrying out refrigerating dehydration of said co-precipitate.

4,540,972

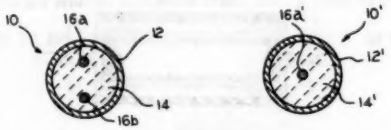
HEAT SENSITIVE CABLE

Bayard C. Davis, Lombard, Ill., assignor to XCO International, Inc., Elgin, Ill.

Division of Ser. No. 317,631, Nov. 2, 1981, Pat. No. 4,491,822. This application Aug. 29, 1984, Ser. No. 645,901

Int. Cl.³ H01C *3/04, 7/04*

U.S. Cl. 338—26 **13 Claims**



1. A heat sensitive cable capable of generating a measurable and predictable voltage over a temperature range of between approximately −20° F. and 1650° F., comprising:

an elongated substantially temperature resistant and moisture impervious tubular metallic sheath;

an elongated conductor means positioned within said sheath, said conductor means being thermoelectrically dissimilar to said sheath and being disposed in spaced and substantially parallel relation to said sheath, said conductor means extending through at least one end of said metallic sheath for measuring said voltage; and

means for electrically insulating said conductor means from said sheath and maintaining said conductor means in spaced and substantially parallel relation to said sheath, said insulation means having an insulation resistance variable with temperature over said temperature range between approximately 100 and 50,000 ohms and being such that said measurable and predictable voltage is generated in said temperature range between said conductor means and said sheath, said measurable and predictable voltage being indicative of temperature and being generated continuously in said temperature range in a passive, self-generating manner.

4,540,973

QUANTIZER FOR A DPCM ENCODER

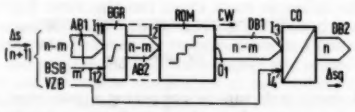
Hans-Joachim Grallert, Groebenzell, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 14, 1984, Ser. No. 580,035

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1983, 3306334

Int. Cl.³ H03K *13/01*

U.S. Cl. 340—347 DD **10 Claims**



1. A digital data quantizer for a difference pulse code modulation ("DPCM") encoder comprising, in combination:

(a) quantizer input means for receiving DPCM signals having numerical value ("NV") bits and a sign bit;

(b) limiter means, connected to receive said NV bits from said quantizer input means, for producing a first digital output signal of constant value when the numerical value of the NV bits received exceeds an upper limit, and second digital output signals of variable value when the numerical value of the NV bits received falls below said upper limit, the values of said second output signals being dependent upon said numerical values;

(c) read-only memory means having an address input and a data output, said address input being connected to receive the output signals of said limiter means for producing, at said data output, quantized DPCM digital signal values in response to the receipt of said output signals; and

(d) quantizer output means, connected to said data output of said read-only memory means for receiving said quantized DPCM signal values, and connected to said quantizer input means for receiving said sign bit.

4,540,974

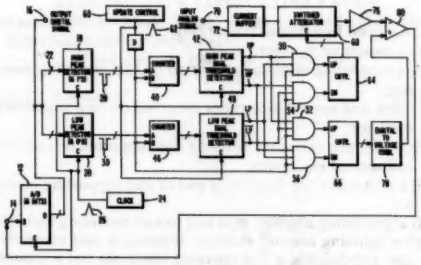
ADAPTIVE ANALOG-TO-DIGITAL CONVERTER

Joseph F. Schanne, Indianapolis, Ind., and Lewis D. Elliott, Philadelphia, Pa., assignors to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 316,658, Oct. 30, 1981, abandoned. This application Feb. 3, 1984, Ser. No. 576,710

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **14 Claims**



1. An arrangement for producing digitized signal samples of an analog signal comprising, in combination:

a gain-controlled source of analog signals having an analog signal output and having respective inputs for receiving a gain control signal and a DC baseline control signal;

means, having an input coupled to said analog signal output of said source of analog signals, and an output, for producing said digitized signal samples of the analog signal applied thereto;

counting means, coupled to said output of said digitized signal sample producing means, and responsive to said digitized signal samples for producing digital control signals occasioned by said digitized signal samples being outside a predetermined range of values at least a fixed number of times over a predetermined interval containing a plurality of digital signal samples;

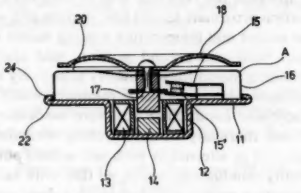
means, having an input response to said digital control signals, and having an output coupled to one of said inputs of said gain-controlled source of analog signals, for producing said gain control signal to control the gain of said gain-controlled source during a succeeding interval; and

means, having an input responsive to said digital control signals and having an output coupled to an other of said inputs of said gain-controlled source of analog signals, for producing said DC baseline control signal to control the DC baseline of said analog signal which is to be digitized during said succeeding interval.

4,540,975
ELECTRIC HORNS

Shigeru Kobayashi, Naganoken, Japan, assignor to Marukokeihouki Co., Ltd., Maruko, Japan

Filed Apr. 6, 1982, Ser. No. 366,106
Int. Cl.³ G08B 3/00
U.S. Cl. 340—388 4 Claims

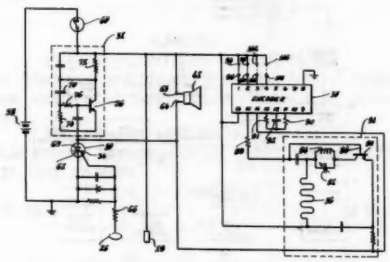


1. In an electric horn composed of an electromagnet formed with an iron support and the combination of an iron piece and a solenoid coil fixed on said iron support, an interrupter for intermittently exciting said electromagnet, a diaphragm fixed around said iron support material to cover said combination of said iron piece, solenoid coil, and interrupter, and an armature fixed on said diaphragm against said iron piece, the improvement wherein said diaphragm comprises a cylinder having a bottom wall and a circular wall extending from said bottom wall toward said iron support and affixed to said iron support, said iron support having a cylindrical dent in the middle section, the dent having a bottom accommodating said iron piece and solenoid coil.

4,540,976
CIRCUIT ARRANGEMENT FOR A BUOYANT ALARM DEVICE

Richard J. Wegrzyn, Stratford, Conn., assignor to Remington Products, Inc., Bridgeport, Conn.

Filed Oct. 29, 1982, Ser. No. 437,845
Int. Cl.³ G08B 1/08
U.S. Cl. 340—539 11 Claims



1. A circuit arrangement for a buoyant alarm device which indicates a disturbance to the quiescent level of a body of water in which the device is placed, said device adapted to float in the body of water and having first and second electrodes, said first electrode adapted to contact the body of water when the device is caused to heel by a disturbance to the quiescent water level, said second electrode positioned in and maintained in contact with the body of water comprising:

a. a bistable electrical switching means having a first nonconductive state and a second conductive state;

b. a first circuit means for causing said bistable switching means to switch from said first nonconductive state to said second conductive state when said first electrode contacts said body of water, and, for automatically initiating restoration of said bistable switching means to said first nonconductive state after a predetermined interval of time, T;

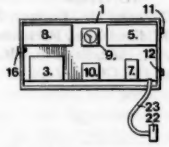
c. a radio frequency transmitter adapted to continuously broadcast a sequence of pulse encoded radio frequency signals during the interval T upon the application of transmitter enabling pulses thereto; and

d. a pulse encoder means coupled to said transmitter for generating and applying to said transmitter predetermined repetitive sequences of transmitter enabling electrical pulses during the interval T.

4,540,977
SURVEILLANCE APPARATUS

Jean-Francois Taillens, Sullens, and Heinz Lechner, Renens, both of Switzerland, assignors to 3S S.A., Geneva, Switzerland

Filed Sep. 30, 1982, Ser. No. 432,362
Int. Cl.³ G08B 13/18
U.S. Cl. 340—552 9 Claims

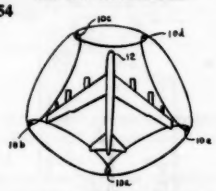


1. Apparatus for monitoring against theft, comprising detection and alarm means that react to an abnormal presence, said means mounted inside a box, said box provided with a fixed integral front face, a removable support plate provided with means making it possible to attach said support plate to a part of a building, said box provided with hinge components, intended to engage cooperating hinge components hinge components located along an edge of said support plate to allow opening of the rear of said box as said box is displaced about hinge components away from said support plate, the opposite edge of said support plate including a part of a lock whose other part is attached to said box, said support plate provided with electric terminals to connect the apparatus to a source of power, said terminals connected to a first contact part of a connector attached to the support plate, a second contact part of the connector being connected by flexible wire to circuits forming part of said means of detection and alarm within said box, said detection and alarm means attached in the box so as to be able to be removed with the box after said displacement of said box away from said support plate and subsequent separation of said first and second contact parts of the connector, and said alarm means including an acoustic warning device activated by said detection means.

4,540,978
BISTATIC PULSE-OVERLAP DOPPLER RADAR INTRUSION DETECTION APPARATUS

Bryan L. Burns, Tijeras, and Michael W. Callahan, Albuquerque, both of N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 7, 1982, Ser. No. 447,736
Int. Cl.³ G08B 13/18
U.S. Cl. 340—554 6 Claims



1. A bistatic pulse-overlap Doppler radar intrusion detection apparatus comprising in combination:

a plurality of Doppler radar units arranged around the periphery of an area to form an enclosed volume, each of said plurality of Doppler radar units comprising a bistatic pulse-overlap Doppler radar having a transmitter unit and a receiver unit, each transmitter unit in said plurality of Doppler radar units transmitting an RF signal which forms a narrow

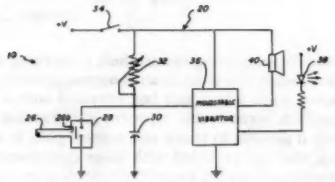
ellipsoidal sensitive volume to an adjacent receiver unit in said plurality of Doppler radar units, each transmitter unit operating on the same RF frequency but on a different pulse repetition frequency than the adjacent transmitter, each receiver unit receiving and synchronizing on the pulse signal received from its associated adjacent transmitter unit by using only that transmitter's RF signal, said receiver units synchronizing only on the direct transmitter to receiver pulse signals, each receiver unit utilizing the overlap between the direct transmitter to receiver pulse signal and the target echo to detect the target Doppler shift.

4,540,979

GRIP-RESPONSIVE OPERATOR ALERTNESS MONITOR

Edward J. Gerger, 1202 Forest Dr., Portage, Mich. 49081, and Scott A. Gerger, 36 Midland Ave., Rochester, N.Y. 14621

Filed Sep. 28, 1982, Ser. No. 426,076
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—576 **5 Claims**



1. In a vehicle having means manually gripped by an operator for controlling operation thereof, an improved monitor for maintaining operator alertness, said monitor comprising:

means, operatively associated with said control means, for sensing operator grip pressure on such control means, said pressure sensing means including a flexible tube closed at one end;

a pressure sensitive switch, operatively coupled to the other end of said tube of said sensing means trapping air within said tube, said switch being changed from a closed state to an open state for producing a signal when operator pressure decreases; and

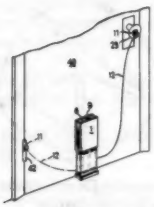
means, operatively coupled to said pressure sensitive switch for producing an operator stimulus in response to a signal from said switch, whereby operator alertness is maintained.

4,540,980

PORTABLE SECURITY ALARM

Daniel Porco, 1050 5th Ave., New York, N.Y. 10028

Filed Aug. 16, 1982, Ser. No. 408,200
Int. Cl.³ G08B *17/06, 17/10, 13/08*
U.S. Cl. 340—586 **12 Claims**



1. In a portable fire alarm unit including a housing supportable on or adjacent to the inner side of a door of a room and containing alarm warning means, temperature sensing means, and fire alarm control means responsively coupled to said temperature sensing means and responding to a sensed temperature above a given value for causing actuation of said warning means;

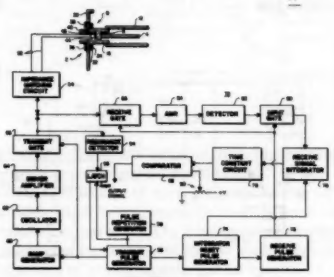
the improvement wherein said alarm unit is provided with thermally conducting means, a first portion of which is configured to pass at least partially along the edge of said door and towards the opposite side of said door, and a second portion proximate to said first portion and which is adapted to accept said temperature sensing means in thermal contact with said second portion, said alarm unit further including means for removably selectively affixing said temperature sensing means in thermal contact with a chosen thermally conducting structure associated with said door and thermally communicating with the other side of said door or alternately with said second portion of said thermally conducting means, so that with said thermally conducting means so mounted on a door and passing substantially therearound and with said temperature sensing means affixed to said second portion of said conducting means, a temperature level indicative of the temperature on the opposite side of the door will be communicated along said thermally conducting means to actuate said alarm, and so that with said temperature sensing means alternatively mounted on said thermally conducting structure associated with said door and thermally communicating with said other side of said door, said warning means will be similarly actuated.

4,540,981

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF LIQUID

Robert A. Lapetina, and Howard P. Jones, both of Salt Lake City, Utah, assignors to Edo Western Corporation, Salt Lake City, Utah

Filed Oct. 29, 1981, Ser. No. 316,506
Int. Cl.³ G08B *21/00*; G01F *23/00*
U.S. Cl. 340—618 **21 Claims**



1. Apparatus for detecting the presence of liquid in a container, said apparatus comprising

a vibratory element mounted so that a part thereof extends into the container and into contact with liquid if a certain amount of liquid is present, and another part is disposed exterior to the container,

electro-mechanical means mechanically coupled to said another part of the vibratory element for vibrating in response to an electrical signal to thereby cause the element to vibrate,

means for applying an electrical signal to said electro-mechanical means during intermittent transmit time phases, and including

means for producing said electrical signal, and

means for applying it to said electro-mechanical means to cause it to vibrate at a frequency which varies periodi-

cally over a range of frequencies which encompasses the resonant frequency of the vibratory element,

means for detecting vibrations of the vibratory element during receive time phases which alternate with the transmit time phases, and for producing a first signal indicative of the amplitude of the vibrations, and

means responsive to said first signal for producing a second signal when said vibrations are below a certain amplitude, indicating that liquid is present about the vibratory element dampening the vibrations.

4,540,982

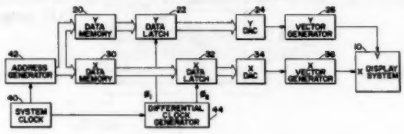
DELAY COMPENSATION METHOD AND APPARATUS FOR DIGITAL DISPLAY SYSTEMS

Lee J. Jalovec, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 17, 1982, Ser. No. 378,665

Int. Cl.³ G09G *1/00*

U.S. Cl. 340—743 **10 Claims**



1. A method of compensating timing errors between signals in separate signal paths, comprising:

generating digital data at a predetermined rate for a first signal path and a second signal path;

generating a differential clock signal in synchronism with said data, said differential clock signal comprising a first clock signal and a second clock signal wherein the time occurrence of the second clock signal is selectably variable with respect to the first clock signal; and

synchronizing the time occurrence of data in said first signal path with said first clock signal, and synchronizing the data in said second signal path with said second clock signal.

4,540,983

FLUORESCENT DISPLAY DEVICE

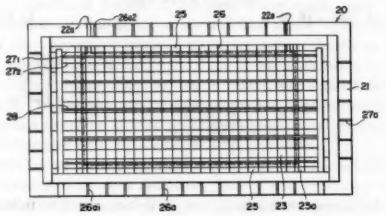
Kiyoshi Morimoto, and Hiroshi Watanabe, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Sep. 29, 1982, Ser. No. 427,524

Claims priority, application Japan, Oct. 2, 1981, 56-157790; Mar. 25, 1982, 57-46409

Int. Cl.³ G09G *3/28*

U.S. Cl. 340—772 **11 Claims**



1. A fluorescent display device comprising:

a fluorescent display tube including a substrate formed of an insulating material, an anode conductor provided on said substrate and having a fluorescent layer deposited thereon, a first control electrode formed by a plurality of control electrode wires arranged in parallel with one another above said anode conductor to cover the entire surface of said fluorescent layer, a second control electrode formed by a plurality of control electrode wires arranged in parallel with one another above said first control electrode to extend in the direction perpendicular to said first control electrode wires, a filamentary cathode stretched above said first and second control electrodes, and a casing hermetically sealed on said substrate to form a highly evacuated envelope; and

a driving circuit applying control voltages corresponding to a display to be obtained to said wires of said first and second control electrodes to select at least one area on said anode conductor and define said area as one picture cell and applying an anode voltage to said picture cell to allow said picture cell to emit light;

wherein said driving circuit includes a first driving circuit section arranged in the X or Y-axis direction of said fluorescent display tube to control said first control electrode and a second driving circuit section arranged in Y or X-axis direction to control said second control electrode, and said driving circuit simultaneously operates said first and second driving circuit sections to apply control voltages to said controlled first and second control electrode wires; and

wherein one of said driving circuit sections simultaneously applies a control voltage to each adjacent two wires of the corresponding control electrode and the other driving circuit section applies a control voltage to each wire of the corresponding control electrode, to thereby define an area on said anode conductor controlled by said first and second control electrode wires as one picture cell.

4,540,984

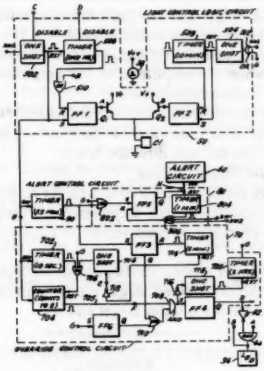
ENERGY SAVING CONTROL CIRCUIT FOR A LIGHT SWITCH AND A METHOD THEREFOR

Herbert H. Waldman, 1739 52nd St., Brooklyn, N.Y. 11204

Filed Nov. 5, 1982, Ser. No. 439,650

Int. Cl.³ H04Q *1/00*; H01H *43/04*

U.S. Cl. 340—825 **90 Claims**



1. An energy saving control circuit for controlling the operation of an electric light, said control circuit comprising:

(A) a switch; and

(B) control means responsive to the actuation of said switch for selectively operating said light in a first timed mode in which said light is turned on for a first predetermined time period and an untimed mode in which said light is turned on for an indefinite time period, said control means:

(1) operating said light in said first timed mode when said switch is actuated in a first manner;

(2) operating said light in said untimed mode when said

switch is actuated in a second manner, different than said first manner; and

(3) operating said light in said untimed mode only if said switch is first actuated in said first manner so as to initiate said first timed mode and said switch is thereafter actuated in said second manner during a predetermined time window defining a portion of said first predetermined time period.

4,540,985

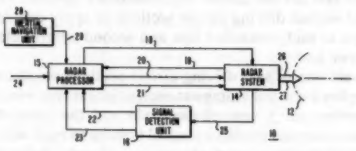
ANGLE WIDTH DISCRIMINATOR/ALTITUDE LINE DETECTOR RADAR

Steven J. Clancy, Elkridge; James F. Whatley, Catonsville, and Dennis Heinke, Columbia, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 908,603, May 23, 1978, abandoned. This application Jun. 2, 1978, Ser. No. 911,867

Int. Cl.³ G01S *7/44*

U.S. Cl. 343—5 DP **4 Claims**



1. A method for operating a pulse radar for acquiring a target comprising the steps of:

transmitting a sequence of signals from an antenna, said antenna radiating most of the electromagnetic energy in a narrow beam having a predetermined beam width;

scanning said antenna to direct said beam along a predetermined path represented by a plurality of path increments, connected in series;

receiving reflected signals emanating from said antenna;

integrating a plurality of said reflected signals arriving at said antenna at a predetermined time interval corresponding to a range cell and path increment for said directed beam to provide an output signal;

thresholding said output signal to provide a target report at times when the amplitude of the output signal is greater than a predetermined value;

repeating the steps of receiving and thresholding for a plurality of time intervals for each of a plurality of path increments for said directed beam;

storing said target reports;

comparing the occurrence of said target reports as a function of said plurality of path increments and range cell location with a plurality of predetermined target report patterns; and

selecting target reports having an occurrence matching one of said predetermined target report patterns indicative of a target having a valid target size.

4,540,986

VIDEO PROCESSOR FOR AIR TRAFFIC CONTROL BEACON SYSTEM

Frank Byrne, Cocoa Beach, Fla., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 28, 1982, Ser. No. 425,201

Int. Cl.³ G01S *13/80*

U.S. Cl. 343—6.8 R **3 Claims**

1. A circuit for use in a transponder located in an aircraft or the like for identifying a true side lobe suppression signal being transmitted by a ground located transmitter system, said true side lobe suppression signal includes at least pulses P1 and P2, said circuit causing said transponder to produce a reply signal upon the amplitude of said P1 pulse being a predetermined ratio to said P2 pulse, said circuit comprising:

(a) an antenna receiving said side lobe suppression signal;

(b) means for amplifying said side lobe suppression signal;

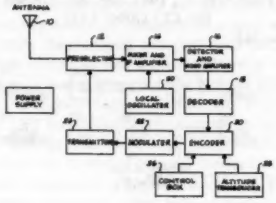
(c) a first transistor having base, emitter and collector electrodes;

(d) a second transistor having a base, emitter and collector electrodes;

(e) a D.C. power supply connected to at least one of said electrodes of said transistors;

(f) means for connecting said collector electrode of said first transistor to said base electrode of said second transistor;

(g) a capacitor connected to said collector electrode of said second transistor and said emitter electrode of said first transistor;



(h) an output terminal connected to said collector electrode of said second transistor;

(i) circuit means for supplying pulse P1 received by said antenna to said base electrode of said first transistor causing said first transistor to turn on which causes said second transistor to turn on charging said capacitor to approximately the same value as pulse P1 and producing a signal on said output terminal;

(j) said circuit means supplying a pulse P2 received by said antenna to said base electrode of said first transistor for being compared with the charge on said capacitor whereby when the amplitude of pulse P2 applied to the base of said first transistor is equal to or less than the charge on said capacitor, no output signal is produced on said output terminal.

4,540,987

AERIAL TOWED BATTLE TARGET

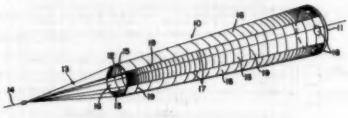
Heinz Werkes, Greding, and Hubert Nöhren, Hamburg, both of Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,435

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312820

Int. Cl.³ F41J *9/10*

U.S. Cl. 343—18 B **13 Claims**



1. An aerial towed battle target in combination therewith having a mechanism for radar detection; comprising:

a hollow body having a base, a front end which is remote from said base and is reinforced in a ring-like manner, and a towing gear associated with said front end; said hollow body further comprising woven lengths of fabric which are sewn together; said woven lengths of fabric contain woven warp and weft threads, and elongated metal elements in the form of metal weft threads which are incor-

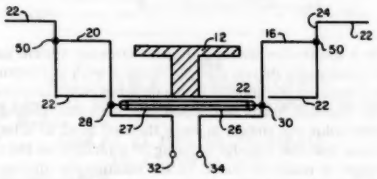
porated between some of said woven weft threads; said metal weft threads are essentially disposed transverse to the direction of towing, and are spaced from one another, along the length of a given woven fabric patern, by non-uniform distances which increase, according to a mathematical principle of relationship ranging from a relatively small minimum dimension of 1 mm to a relatively large maximum dimention of 150 mm beginning somewhere along the length of said hollow body so that radar reflection, and hence discovery and pick-up of the target are improved especially herewith.

4,540,988

BROADBAND MULTI-ELEMENT ANTENNA

Benedikt A. Munk, Columbus, Ohio, and Clayton J. Larson, North Hollywood, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 13, 1983, Ser. No. 503,457
Int. Cl.³ H01Q *3/24, 21/00*
U.S. Cl. 343—728 **2 Claims**



1. A broadband multi-element antenna operational at radio frequencies comprising in combination:

a body providing a ground plane and defining a cylindrically shaped cavity disposed within the body,

a monopole antenna element disposed radially central of the cavity, said monopole being excitable by radio frequency signals provided from an external source,

a plurality of antenna elements disposed at ninety degree increments about the periphery of the cavity, spaced from the monopole but electrically interactive with the monopole and excitable by said signal frequencies from said external source, said plurality of elements being switchably fed for changing the radiation pattern of the antenna,

a plurality of isolation traps connected between selected pairs of the plurality of antenna elements, each of said isolation traps comprising a first transmission line of effective electrical length of one-half wavelength, said first transmission line being an open circuit at the signal inputs of the respective antenna elements when signals at the inputs to the selected pairs of the antenna elements are of equal amplitude and 180° out of phase, and a short circuit at the respective pair of elements when in phase radiated signals from the monopole parasitically excite the respective pair of antenna elements and

a plurality of switching traps connected one to each of the plurality of antenna elements, each of the switching traps comprising a second transmission line having an effective electrical length of one-quarter wavelength and a switchable means connected in series with said second transmission line to ground for selectively deactivating the respective elements in pairs for changing the radiation pattern of the antenna,

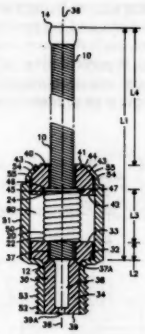
the second transmission line being a short circuit at the selected radio frequency of the signal, the switchable means being actuatable from an external source.

4,540,989

WHIP ANTENNA ASSEMBLY EXHIBITING INCREASED DURABILITY

Samuel W. Day, Jr., Miramar, Fla., assignor to Motorola, Inc., Schaumberg, Ill.

Filed Jul. 5, 1983, Ser. No. 510,853
Int. Cl.³ H01Q *1/20, 9/30*
U.S. Cl. 343—900 **11 Claims**



1. An antenna comprising:

a first closely wound coil spring member of electrically conductive material having opposed ends and exhibiting a first predetermined length, one end of said first member being designated the feedpoint of said antenna, said first spring member being wound in one of clockwise and counter-clockwise directions as viewed from said antenna feedpoint;

a second closely wound coil spring member having opposed ends and exhibiting a second predetermined length substantially less than said first predetermined length, said second spring member being wound around a portion of said first member adjacent said feedpoint in the remaining direction of said clockwise and counter-clockwise directions such that said second spring member is fixedly anchored to said first spring member, and

a housing of rigid material having first and second opposed housing ends, and upper and lower apertures aligned on a common axis and situated at said first and second housing ends, respectively, said second spring member being situated between the first and second housing ends with the first member therein extending through the upper aperture at one end of said second spring member and extending into the lower aperture at the remaining end of the second spring member, each aperture exhibiting a diameter sufficiently large to accommodate said first member therein and sufficiently small to captivate said second member between said first and second housing ends.

4,540,990

INK JET PRINTER WITH DROPLET THROW DISTANCE CORRECTION

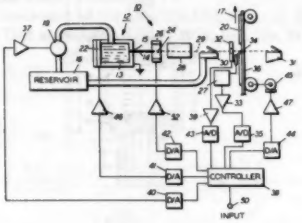
Peter A. Crean, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 22, 1984, Ser. No. 663,512
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **6 Claims**

1. An improved, continuous stream type ink jet printer of the type having a grounded, pressurized droplet generator with a plurality of nozzles in a linear array which emit streams of ink therefrom that are directed towards a moving recording medium, a charging electrode for each stream of ink located at the location where ink droplets are formed, whereat each droplet is encoded with a voltage representative of digitized information, a deflection electrode pair for each stream of droplets to

direct the passing droplets to a specific location on the recording medium or to a gutter in accordance with the voltage the droplets received from the charging electrodes, a calibration sensor for calibrating the droplets so that they are properly stitched together at a predetermined printing plane, and a controller for operating the printer wherein the improvement comprises:

a linear array of distance sensing sensors mounted in a support member that is located below the droplet trajectories, the distance sensing sensors being parallel to the surface of the recording medium and perpendicular to direction of movement thereof, each distance sensor being adapted to produce a signal representative of the actual droplet throw distance from one or more nozzles to the surface of the recording medium at predetermined time periods;



means for comparing the signal representative of the actual droplet throw distance with a signal representative of a predetermined droplet throw distance;

means for generating a comparison signal in response to the comparison of the actual and predetermined throw distance signals, said comparison signal indicating any increase or decrease in the actual throw distance relative to the predetermined throw distance; and

means for adjusting the droplet trajectories in response to said comparison signals to correct the droplet trajectories for variations in the droplet throw distance relative to the predetermined printing plane and maintain the droplet placement accuracies in spite of said throw distance variations.

4,540,991

THERMAL PRINTING SYSTEM

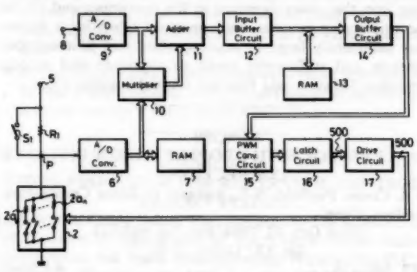
Izumi Kariya, Tokyo, and Yzsuhito Eguchi, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 2, 1984, Ser. No. 626,765

Claims priority, application Japan, Jul. 4, 1983, 58-121170

Int. Cl.[3] **H05B** *1/02;* **B41J** *3/20*

U.S. Cl. 346—76 PH **18 Claims**



1. Apparatus for use in a thermal printing system of the kind having a thermal print head with a plurality of resistive elements for printing an image line-by-line from printing data fed thereto, comprising:

detector means selectively connected to each of said resistive elements for deriving data corresponding to an actual resistance value of each of said resistive elements;

memory means connected to receive said derived data from said detector means for retaining said derived data at addresses corresponding to each of said resistive elements; and

compensating means connected to said memory means and receiving said printing data for compensating said printing data according to said derived data retained in said memory means.

4,540,992

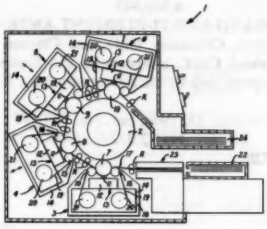
THERMAL COLOR TRANSFER SYSTEM

Murato Moteki; Yoshio Shimada; Fumihiro Tanaka; Fumio Watanabe, and Kazuyuki Komatsu, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,953

Int. Cl.[3] **G01D** *15/10;* **G03G** *15/01;* **B41J** *31/02*

U.S. Cl. 346—76 PH **8 Claims**



1. In a multicolor thermal transfer copying system having plural rotationally driven platens coacting with corresponding thermal heads to frictionally feed a copying paper successively past the thermal heads in conjunction with the feeding of a different color ink ribbon at each thermal head to effect the multicolor thermal transfer printing of a picture on the copying paper: a rotatable metal roller rotationally driven at a predetermined speed of rotation during use of the system; and means mounting the plural platens in angularly spaced relation about the periphery of the metal roller and in direct frictional contact with the peripheral surface thereof such that the platens are all frictionally rotationally driven at the same peripheral speed in response to rotation of the metal roller and the heat generated by the thermal heads is effectively taken off by the metal roller through the platens.

4,540,993

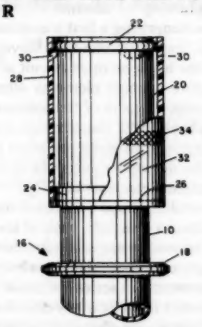
PLOTTER PEN

Charles Gunderson, Buena Park, and Aftab H. Kapadya, Brea, both of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 23, 1984, Ser. No. 633,172

Int. Cl.[3] **G01D** *15/16;* **B43L** *13/00*

U.S. Cl. 346—139 R **6 Claims**



1. In a pen for a graphics plotter having a hollow, cylindrical body having top, middle and bottom portions wherein the bottom portion is adapted to carry a writing tip and the middle portion is adapted to be releasably gripped by a gripping means and includes a circumferential guide ridge for repeatably posi-

tioning the pen longitudinally with respect to the gripping means, the improvement for permitting the pen to be accurately and repeatably optically scanned by a light beam for data-coveying indicia comprising:

(a) a retaining ridge disposed circumferentially about the outer surface of the pen body adjacent the top end of the top portion;

(b) a support ridge disposed circumferentially about the outer surface of the pen body adjacent the boundary of the top and middle portions, said support ridge being of substantially the same height above the outer surface of the pen body as said retaining ridge;

(c) a stop shoulder disposed between said support ridge and the guide ridge at a distance from the guide ridge such that will put the area between said stop shoulder and said retaining ridge adjacent said stop shoulder repeatably and accurately in the path of the scanning light beam when the pen is in the gripping means; and,

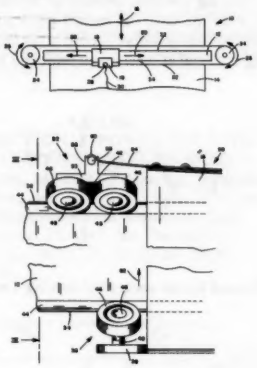
(d) a cylindrical sleeve having an inside diameter sized with relationship to said retaining ridge and said support ridge such that said sleeve can be slid over said ridges into abutment with said stop shoulder, said sleeve also having circumferentially disposed gripping projections along its inner surface adapted to releasably snap over said retaining ridge and hold said sleeve against movement in abutment with said stop shoulder, said sleeve further having a reflective outer surface for reflecting a light beam.

4,540,994

RELEASABLE PEN BLOCK GUIDE

James Lawrence, Irvine, Calif., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 23, 1984, Ser. No. 633,173
Int. Cl.[3] G01D *15/16*
U.S. Cl. 346—139 R **8 Claims**



1. In a graphics plotter having a track disposed parallel and transverse to a moving web of writing medium and a pen block carriage mounted for movement along the track on sets of wheels bearing on parallel front and rear surfaces of the track, the improvement comprising:

(a) a pair of first wheel sets rigidly attached to one side of the pen block adapted to guide the pen block carriage along the track in a preselected path when held in contact with one of the front and rear surfaces of the track;

(b) a pair of second wheel sets carried by the pen block carriage and adapted for movement between a first position in contact with the other of the front and rear surfaces of the track and a second position out of contact with said other surface of the track and spaced from said first wheel sets sufficiently to allow the pen block carriage to be removed from the track; and,

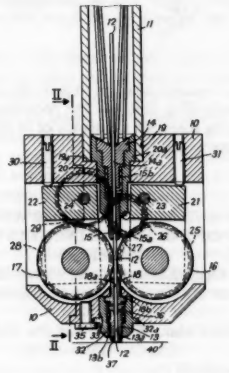
(c) biasing means carried by the pen block carriage for urging said first and second wheel sets against their respective contacted surfaces when said second wheel sets are placed in said first position.

4,540,995

PENCIL DEVICE FOR PLOTTING MACHINE

Michel Roche, Courtry, France, assignor to Benson S.A., Creteil, France

Filed Apr. 6, 1984, Ser. No. 597,778
Claims priority, application France, Aug. 4, 1983, 83 05776
Int. Cl.[3] G01D *15/24*
U.S. Cl. 346—139 C **17 Claims**



1. A pencil device for use with a plotting machine to produce a trace on a recording medium when said pencil device is moved on the recording medium during a writing operation, comprising:

a housing comprising barrel means with passage means therethrough for receiving a lead, said passage means having an exit for the lead at a forward end of said barrel means;

lead feeding means located in said housing for containing spare leads and for continuously feeding said passage means with a lead;

lead driving means in said housing for pressing said lead located in said passage means against said recording medium during the writing operation; and

means for urging the said forward end of said barrel means in contact with said recording medium whereby a consumed lead is replaced by a new lead without interrupting a trace being produced.

4,540,996

RECORDING APPARATUS

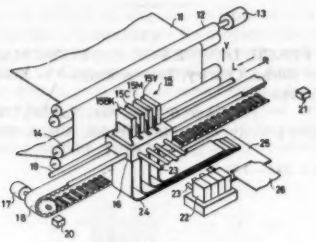
Seiji Saito, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1983, Ser. No. 490,432
Claims priority, application Japan, May 11, 1982, 57-77428; May 11, 1982, 57-77432; May 11, 1982, 57-77434
Int. Cl.[3] G01D *15/18*
U.S. Cl. 346—140 R **11 Claims**

1. Color image recording apparatus comprising a recording unit including first and second recording head groups for recording in first and second colors, respectively, each said group including N recording heads, and driving means for moving said recording unit relative to a recording medium in a main scanning direction to perform a plurality of main scans and in a subscanning direction; wherein:

said N heads of each said group are substantially aligned in the subscanning direction at intervals of K resolution elements;

said first group is displaced relative to said second group in the subscanning direction by at least one resolution element; and



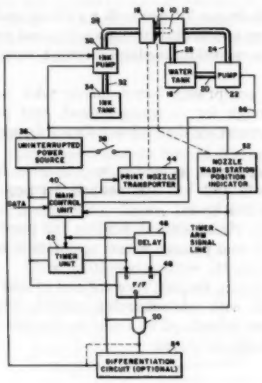
said driving means is adapted to provide relative movement to said recording unit and the recording medium in the subscanning direction a distance of N resolution elements for successive main scans.

4,540,997

METHOD AND APPARATUS FOR AVOIDING THE DRYING OF INK IN THE INK JETS OF INK JET PRINTERS

Lawrence G. Biggs, Beaverton, and Pierre Radochonski, Lake Oswego, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 26, 1984, Ser. No. 593,326
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **5 Claims**



1. Ink jet recording apparatus comprising:

ink ejection means for selectively dispensing ink;

transporting means for positioning the ink ejection means during a stand-by mode in response to an end of copy signal;

wash station means for coupling with said ink ejection means during the stand-by mode;

control unit means disposed to be coupled to receive power from an uninterrupted power source for generating an end of copy signal in response to input data signals;

timer unit means disposed to be coupled to receive power from an uninterrupted power source for determining a first time period since the occurrence of the end of copy signal and the last ejection of ink from the ink ejection means, and for generating an output signal when said first time period exceeds a first selected time period;

ink ejection driving means disposed to be coupled to receive power from an uninterrupted power source for driving the ink ejection means to eject ink into the wash station means for a second selected time period in response to the output signal from the timer unit means, and for generating a signal to reset the timer unit means following the expiration of the second selected time period.

4,540,998

RECORD MEMBER

Jerome R. Bodmer, and Robert E. Miller, both of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed May 23, 1984, Ser. No. 612,943
Int. Cl.³ B41M *5/16, 5/22*
U.S. Cl. 346—212 **12 Claims**

1. A record member comprising a substrate and a color developer composition comprising a zinc-modified addition product prepared by a process comprising mixing together and heating an addition product of phenol and a diolefinic alkylated or alkenylated cyclic hydrocarbon, a zinc compound selected from the group consisting of zinc oxide and zinc carbonate, benzoic acid and a weak base.

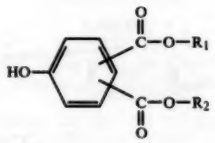
4,540,999

HEAT-SENSITIVE RECORD MATERIAL

Naoto Arai, Ikeda, Japan, assignor to Kanzaki Paper Manufacturing Co., Ltd., Japan

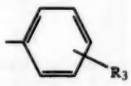
Filed Jul. 10, 1984, Ser. No. 629,388
Claims priority, application Japan, Jul. 13, 1983, 58-128268
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—216 **10 Claims**

1. A heat-sensitive record material comprising a base sheet and a heat-sensitive record layer formed over the base sheet and containing a colorless or pale-colored basic dye and a color developing material capable of forming a color when contacted with the dye, the record material being characterized in that the heat-sensitive record layer contains as the color developing material at least one compound represented by the formula

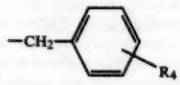


(I)

wherein R_1 and R_2 are each alkyl having 1 to 8 carbon atoms, a group



or a group



wherein R_3 and R_4 are each a hydrogen atom, chlorine atom, hydroxyl or alkoxy having 1 to 8 carbon atoms, the heat-sensitive record layer further containing at least one compound

selected from the group consisting of 1,1-bis(4-hydroxyphenyl)cyclohexane and hindered phenol compounds.

4,541,000

VARACTOR OR MIXER DIODE WITH SURROUNDING SUBSTRATE METAL CONTACT AND TOP SURFACE ISOLATION

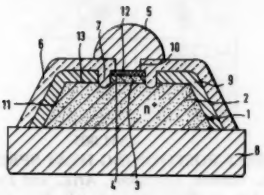
Alexander Colquhoun, Heilbronn-Sontheim, and Erhard Kohn, Leingarten, both of Fed. Rep. of Germany, assignors to TELEFUNKEN electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,185

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1980, 3005302

Int. Cl.³ H01L *29/48*

U.S. Cl. 357—15 **15 Claims**



1. A varactor or mixer diode comprising: a semiconductor element which has a mesa shape with inclined side faces; a rectifying pn-junction or a rectifying metal semiconductor junction (Schottky contact) on the upper face of said mesa shaped semiconductor element; a metal plate forming an ohmic substrate contact disposed on the lower face of said mesa shaped semiconductor element, said substrate contact having a metal portion which completely extends over said side faces of said semiconductor element onto said upper face which is provided with said rectifying junction, and which ends at a small spacing from said junction; and an electrical isolation means disposed in said upper face for separating said junction from said metal portion.

4,541,001

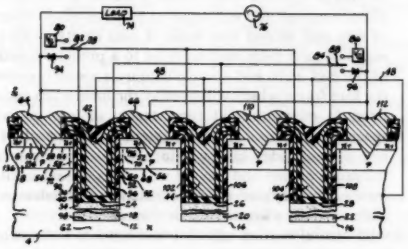
BIDIRECTIONAL POWER FET WITH SUBSTRATE-REFERENCED SHIELD

Herman P. Schutten, Milwaukee; James A. Benjamin, Waukesha, both of Wis., and Robert W. Lade, Fort Myers, Fla., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 23, 1982, Ser. No. 421,933

Int. Cl.³ H01L *29/78, 29/06, 29/40*

U.S. Cl. 357—23.4 **19 Claims**



1. A bidirectional FET, comprising:

a first source region of one conductivity type semiconductor material;

a first channel region of opposite conductivity type semiconductor material forming a junction with said first source region;

a single drift region of one conductivity type semiconductor material forming another junction with said first channel region;

a second channel region of said opposite conductivity type semiconductor material forming a junction with said drift region;

a second source region of said one conductivity type semiconductor material forming a junction with said second channel region;

a notch extending between and separating said first and second source regions and said first and second channel regions, and extending into said drift region;

first insulated gate means in said notch proximate said first channel region and adapted for application of an electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said first channel region;

second insulated gate means in said notch proximate said second channel region and adapted for application of an electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said second channel region;

whereby upon application of voltage of either polarity to said first and second source regions, electric current can flow in a respective corresponding direction between them, under control of said electrical potential of said gate means, the conductive current path through said drift region traversing along one side of said notch then around the end thereof then along the other side of said notch, and such that in the absence of said electric gate potential, said FET is in an OFF state blocking current flow in both directions, said single drift region around said notch supporting OFF state blocking voltage in both directions; and

shielding means in said notch insulated between said first and second gate means and ohmically connected to said drift region to be at substantially the same potential level thereof for preventing electric field gradient induced depletion in said drift region along said notch in said OFF state, to prevent unwanted inducement of conduction channels.

4,541,002

PROTECTIVE DEVICE FOR A SEMICONDUCTOR INTEGRATED CIRCUIT INCLUDING DOUBLE POLYSILICON RESISTOR

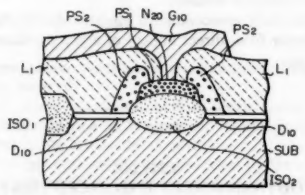
Hiroshi Shimada, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1982, Ser. No. 393,117

Claims priority, application Japan, Jun. 30, 1981, 56-100505

Int. Cl.³ H01L *27/02*

U.S. Cl. 357—51 **9 Claims**



1. A protective device for protecting a semiconductor integrated circuit from static electricity, comprising:

a protective input transistor for protecting the semiconductor integrated circuit from a high input voltage;

a semiconductor substrate;

a diffusion region formed in said semiconductor substrate;

a first insulating film formed on the surface of said semiconductor substrate adjacent to said diffusion region;

a second insulating film formed as an island in said diffusion region;

a first polysilicon layer, having a first concentration of impurities, formed on a portion of said second insulating film;

a second polysilicon layer, having a second concentration of impurities lower than said first concentration of impurities of said first polysilicon layer, formed on a portion of said second insulating film and connecting a peripheral portion of said first polysilicon layer and said diffusion region;

a contact portion formed on a portion of said first polysilicon layer;

an oxidation film, formed over said first insulating film, said exposed portions of said diffusion region and said semiconductor substrate, and said first and second polysilicon layers except for said contact portion, for insulating between layers; and

an input electrode metal layer, formed over said contact portion, for electrically connecting said diffusion region.

4,541,003

SEMICONDUCTOR DEVICE INCLUDING AN ALPHA-PARTICLE SHIELD

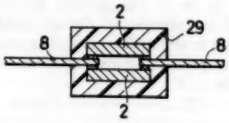
Kanji Otsuka, Higashiyamato; Kazumichi Mitsusada, Kodaira; Masao Sekibata, Kunitachi, and Shinji Ohnishi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 94,914, Nov. 16, 1979, abandoned. This application Jun. 14, 1982, Ser. No. 388,216

Claims priority, application Japan, Dec. 27, 1978, 53-159831

Int. Cl.[3] **G11C** *11/40;* **H01L** *27/04, 23/08*

U.S. Cl. 357—74 **24 Claims**



24. An alpha particle resistant semiconductor arrangement comprising:

a first and a second semiconductor element, each semiconductor element having a circuit adjacent one surface thereof,

said first and second semiconductor elements being mounted in a package with said surface adjacent said circuit of said first semiconductor element being in face to face relationship with said surface adjacent said circuit of said second semiconductor element,

such that each semiconductor element shields the circuit of the other from direct impact of alpha particles from said package.

4,541,004

AERODYNAMICALLY ENHANCED HEAT SINK

Richard M. Moore, El Cajon, Calif., assignor to Burroughs Corporation, Detroit, Mich.

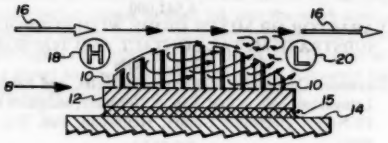
Filed Nov. 24, 1982, Ser. No. 444,159

Int. Cl.[3] **H01L** *23/36, 23/14*

U.S. Cl. 357—81 **5 Claims**

1. A heat sink for cooling an integrated circuit package, said heat sink comprising:

a plurality of metallic pins each having one end thereof attached to the integrated circuit package and the second end thereof being disposed for heat dissipation, said plural-



ity of pins being of varying lengths such that a partial hemisphere is formed with the second ends thereof.

4,541,005

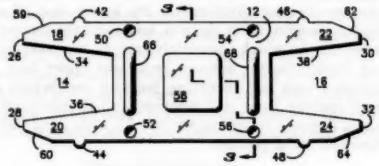
SELF-POSITIONING HEAT SPREADER

William L. Hunter, Scottsdale, Ariz., and Paul R. Theobald, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 365,114, Mar. 30, 1982, abandoned. This application Apr. 2, 1984, Ser. No. 595,646

Int. Cl.[3] **H01L** *23/30, 23/36*

U.S. Cl. 357—81 **7 Claims**



1. A heat spreader adapted for insertion into a mold cavity prior to encapsulation thereof for conducting heat away from a metal lead frame and configured to minimize capacitance between the heat spreader and the lead frame, said heat spreader being substantially parallel to a first surface of the metal lead frame having a semiconductor die mounted on a first portion of the lead frame and connected to a second surface of the lead frame, the heat spreader comprising:

a heat conductive frame having first and second notches formed in opposite ends thereof to define bifurcated limbs sized to extend into within a first predetermined tolerance of first and second end walls of said cavity, with inner edges of each such limb tapering to a predetermined one of the end walls and complementing a second portion of the lead frame which will overlay the limb when encapsulated to minimize said capacitance, at least a pair of spaced-apart lateral standoffs extending from each of first and second sides into within a second predetermined tolerance of first and second side walls of said cavity, at least a pair of spaced-apart feet extending a predetermined distance from a lower surface thereof; and

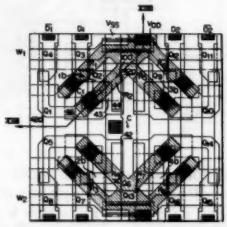
a solid central portion adjacent said notches and extending to within a third predetermined tolerance of the first surface of the portion of said lead frame on which said die is mounted when encapsulated, whereby said first, second and third predetermined tolerances are selected so that said heat spreader is self-positioning with respect to said mold cavity and said lead frame.

4,541,006

STATIC MEMORY HAVING LOAD POLYSILICON RESISTORS FORMED OVER DRIVER FET DRAINS

Shoji Arizumi, Tokyo, and Makoto Segawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 187,794, Sep. 16, 1980, Pat. No. 4,453,175. This application Jan. 19, 1984, Ser. No. 571,948
Claims priority, application Japan, Sep. 19, 1979, 54-119234
Int. Cl.[3] H01L *27/04*; G11C *11/40*
U.S. Cl. 357—41 3 Claims



1. A semiconductor device comprising:

a first semiconductor region and first to fourth memory cell-forming areas all formed on a semiconductor substrate of a first conductivity type,

said first semiconductor region having a second conductivity type opposite to said first conductivity type and including a center region and first to fourth extension regions which extend in four directions away from said center region, two in a row direction and two in a column direction, thereby dividing a major surface of said semiconductor substrate into said first to fourth memory cell-forming areas, each of said cell-forming areas including:

a second semiconductor region of the second conductivity type having one end formed proximate said first extension region which extends in said row direction, for forming a first driver transistor between said second semiconductor region and said first extension region;

a third semiconductor region of the second conductivity type formed proximate said second extension region which extends in the column direction, for forming a second driver transistor between said third semiconductor region and said second extension region;

a fourth semiconductor region of the second conductivity type formed close to the other end of said second semiconductor region, for forming a first switching transistor between said fourth semiconductor region and said second semiconductor region;

fifth and sixth semiconductor regions of the second conductivity type formed close to each other, for forming a second switching transistor therebetween;

a first polycrystalline silicon gate electrode formed between said first extension region and the one end of said second semiconductor region and being the gate electrode of said first driver transistor, one end of said first gate electrode extending in the column direction and being connected to said fifth semiconductor region, and the other end of said first gate electrode being connected to said third semiconductor region;

a second polycrystalline silicon gate electrode formed between said second extension region and said third semiconductor region and being the gate electrode of said second driver transistor, one end of said second gate electrode being connected to said second semiconductor region;

a polycrystalline silicon word line formed in the row direction on a gate insulation layer and being a common gate electrode of said first and second switching transistors;

a first resistance polycrystalline silicon layer formed above said second semiconductor region on an insulation layer therebetween, one end of said first resistance layer being in contact with said second semiconductor region and said second polycrystalline silicon gate electrode such that said first resistance layer is used as a load for said first driver transistor;

a second resistance polycrystalline silicon layer formed above said third semiconductor region on an insulation layer therebetween, one end of said second resistance layer being in contact with said third semiconductor region and said first polycrystalline silicone gate electrode such that said second resistance layer is used as a load for said second driver resistor;

a common resistance polycrystalline silicon layer formed above a free end of said second extension region for connecting said first and second resistance polycrystalline silicon layers at one end;

a metal ground line formed in the column direction on an insulation layer so as to extend above said center region for connecting with said first semiconductor region; and

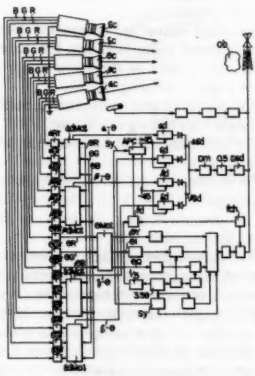
first and second metal data lines formed in the column direction and connected to said first and second switching transistors, respectively.

4,541,007

STEREOSCOPIC COLOR TELEVISION SYSTEM

Kiyoshi Nagata, 209, Kosugicho 2 chome, Nakahara-ku Kawasaki-shi, Kanagawa 211, Japan

PCT No. PCT/JP81/00178, § 371 Date Jun. 15, 1982, § 102(e) Date Jun. 15, 1982, PCT Pub. No. WO82/01973, PCT Pub. Date Jun. 10, 1982
PCT Filed Aug. 15, 1981, Ser. No. 395,031
Claims priority, application Japan, Dec. 1, 1980, 55-168001
Int. Cl.[3] H04N *9/60, 9/54, 7/08*
U.S. Cl. 358—3 6 Claims



1. A stereoscopic color television transmission method comprising the steps of:

photographing an object by five video cameras each of which generates a color signal and which are equidistantly spaced in the horizontal direction;

transmitting video information detected by the central camera in substantially the same method as the transmission method used in a given color television system having assigned channels at certain reference frequencies and a certain color subcarrier frequency; and

transmitting four video difference signals, using a composite video difference signal carrier wave which has been generated by amplitude modulating positive halfwaves and negative halfwaves of each of two currents having a phase difference of 90° with four video difference signals generated by subtracting the video signal detected by the cen-

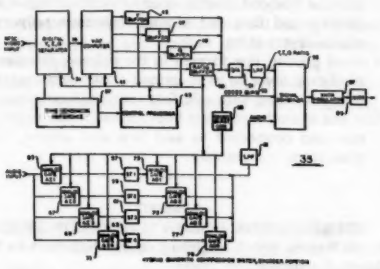
tral camera from the other four video signals detected by the other four cameras and synthesizing the positive and negative halfwaves.

4,541,008

TELEVISION SIGNAL BANDWIDTH REDUCTION USING VARIABLE RATE TRANSMISSION

Max Fishman, Sacramento, and James D. Nichols, Carmichael, both of Calif., assignors to Jones Futura Foundation, Ltd., Fair Oaks, Calif.

Filed Dec. 27, 1982, Ser. No. 453,538
Int. Cl.³ H04N 9/32
U.S. Cl. 358—13 **4 Claims**



1. A television signal transmission system incorporating means for processing encoding a repetition reduce signal, said system comprising:

a. a component separator for generating sampled digital values of the color and intensity components of a television signal,

b. buffer storage means for storing the separated components of the video signal,

c. data processing means for comparing successive samples of the component video data and for generating variable-length blocks of data to represent either slowly varying signals or rapidly varying signals,

d. means for encoding and multiplexing audio and synchronization data into the signal stream,

e. means for encoding signal and control data for transmission to a receiver,

f. means for processing the received signal to establish synchronization,

g. means for demultiplexing the received signal to extract the audio information, and

h. means for demultiplexing the component video information and reconstructing the composite video signal from the repetition-reduced representation,

wherein the signal data is divided into blocks containing a fixed number of input samples and whose output block sizes depend on signal content, and wherein a slowly varying input signal is represented by a reduced number of output samples, and a rapidly varying input signal is represented on a one-to-one basis at corresponding sampling points except where control information is introduced, and further

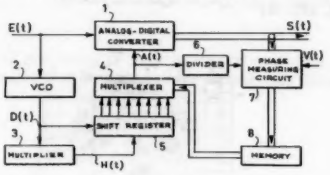
wherein a block of n samples representing a slowly varying input signal succeeded by a block representing another slowly varying input signal is represented by the first and middle samples of the former block; or in the case of a block of n samples representing a segment of input data which is succeeded by a block representing rapidly varying data, the former block is represented by the first n-2 input samples while the last two input samples are replaced by rate-tags; the rate-tags are control signals which have a magnitude of 0 units when the output segment contains no more than two clock intervals or a full-magnitude when the output segment length is greater than two clock intervals.

4,541,009

PROCESS AND DEVICE FOR SAMPLING A SINE WAVE SIGNAL BY A MULTIPLE FREQUENCY SIGNAL

Daniel Rougeolle, and Pascal Porrot, both of Paris, France, assignors to Thomson CSF, Paris, France

Filed Jul. 12, 1982, Ser. No. 397,341
Claims priority, application France, Jul. 24, 1981, 81 14421
Int. Cl.³ H04N 9/32
U.S. Cl. 358—13 **16 Claims**



1. A process for sampling a sine wave input signal E(t) having frequency F and a reference phase value, by a sampling signal A(t) having a frequency kF, where k is a positive integer, so as to produce a minimum relative phase displacement between said signals, comprising the following steps:

generating a signal D(t) of frequency kF, which is dependent in phase on said input signal E(t);

generating a sampling signal A(t) of frequency kF, on the basis of said signal D(t), with a plase regulatable compared with said input signal E(t) in increments of T/kp, T being the cycle of said input signal E(t) and p a positive integer, said sampling signal A(t) having a plurality of possible phase settings;

generating a phase reference signal from said sampling signal A(t) and measuring a relative phase swing of said sampling signal A(t) compared with said input signal E(t);

selecting one of said plurality of possible phase settings of said sampling signal A(t) so as to minimize said relative phase swing of said signal compared with said reference phase value of the input signal E(t).

3. A process according to claim **1**, wherein said generating and measuring step includes the steps of:

generating a digital multibit binary word signal S(t) of frequency F from said input signal E(t);

generating a signal of frequency F by dividing said sampling signal A(t) by k; and

measuring said relative phase swing between said signal S(t) and said divided signal.

4. A process according to claim **3**, wherein said input signal E(t) is a composite television signal of a field simultaneous color television system, said television signal being divided into time intervals representing scanning lines of a display means with, at the start of said intervals, a burst of high frequency sine wave or so-called subcarrier signals, and wherein p equals 8 and k equals 4n, with n being an integer equal to or higher than 1.

4,541,010

ELECTRONIC IMAGING CAMERA

Lawrence E. Alston, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 17, 1983, Ser. No. 505,426
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 **20 Claims**

1. An electronic camera for recording still images comprising:

a two dimensional image sensing array comprising a predetermined number of discrete image sensing areas;

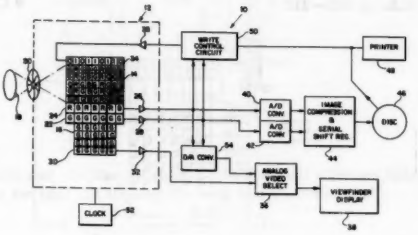
a two dimensional image storing array comprising a predetermined number of discrete image storing areas, said predetermined number of discrete image storing areas

being substantially less than said predetermined number of discrete image sensing areas;

means for providing a viewfinder display;

means for recording image data on a select recording medium; and

means for controlling the sampling and transfer of image data from said image sensing array to said image storing array for storage therein during a preview mode of operation and for subsequently transferring said image data stored in said image storing array to said viewfinder display means to provide a visual display of said image data during said preview mode of operation, said image data control means being operable during a record mode of operation to control the transfer of image data from said image sensing array to said image recording means to enable said image data to be recorded by said recording means.

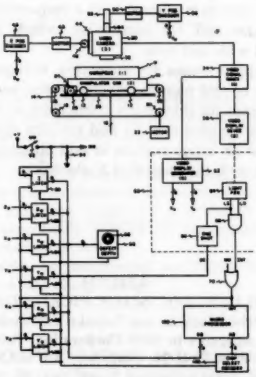


4,541,011

SYSTEM FOR RECORDING THE LOCATIONS OF WORKPIECE DEFECTS

Robert A. Mayer; Michael W. Reith, and Jack L. Odell, II, all of Snohomish County, Wash., assignors to Western Gear Corporation, Everett, Wash.

Filed Mar. 15, 1982, Ser. No. 358,425
Int. Cl.³ H04N 7/18
U.S. Cl. 358—106 **10 Claims**



1. A system for providing a record of the location of visually perceptible defects on the surface of a workpiece, comprising:

a video camera generating an image of said workpiece surface, said camera having a known position with respect to said workpiece;

video display means receiving the output of said video camera for displaying said image on a video screen;

marking means for providing an electrical indication of the position of said visually perceptible defects on the screen of said video display means;

processing means receiving the electrical indications from said marking means to determine and record the position of said defect on the surface of said workpiece by correlating the position of the defect as viewed on said video display means with the position of said video camera with respect to said workpiece;

actuating means for changing the relative positions of said video camera and said workpiece in at least one dimension substantially parallel to the surface of said workpiece; and

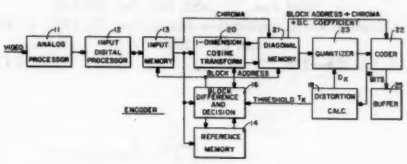
position-sensing means for providing an electrical indication of the position of said workpiece with respect to said video camera in each dimension of workpiece movement, said position indication being applied to said processing means which correlates the relative position between said workpiece and camera with the position of said defect on the screen of said video display means to determine and record the position of said defect on the surface of said workpiece as the relative position between said workpiece and camera changes.

4,541,012

VIDEO BANDWIDTH REDUCTION SYSTEM EMPLOYING INTERFRAME BLOCK DIFFERENCING AND TRANSFORM DOMAIN CODING

Andrew G. Tescher, Claremont, Calif., assignor to Compression Labs, Inc., San Jose, Calif.

Filed Jan. 4, 1982, Ser. No. 336,984
Int. Cl.⁴ H04N 7/12
U.S. Cl. 358—133 **35 Claims**



1. A method for processing time domain information signals having a successive field format to effect substantial compression of said signals, said method comprising the steps of:

comparing corresponding blocks of time domain information signals from successive fields to form a block difference signal;

converting a block of said time domain information signals to transform domain signals including a D.C. coefficient representing the average intensity of a converted block and a plurality of discrete transform coefficients when said block difference signal exceeds a first variable parametric value;

varying said first variable parametric value in accordance with the number of blocks selected for conversion; and

encoding said transform domain coefficients for subsequent utilization.

4,541,013

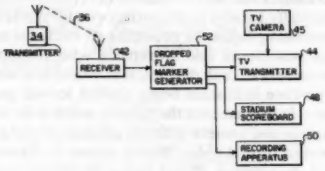
FOOTBALL SIGNALING SYSTEM

Sidney A. Alpert, 12514 Davan Dr., Silver Spring, Md. 20904

Filed Jul. 19, 1982, Ser. No. 399,338
Int. Cl.³ H04N 5/24, 7/08
U.S. Cl. 358—142 **12 Claims**

1. An arrangement for enhancing the viewing enjoyment by spectators of a sports game or contest of the type involving a playing field and two teams of opposing players thereon which engage in the play of a game or contest, the game or contest being one in which at least one referee is present for the purpose of observing any infractions of rules of the game or contest, the referee signifying an infraction of the rules by drop-

ping a flag carried by him, comprising, means carried by the referee for sensing the removal of the flag from its normal location on or about the body of the referee, a spectator viewed video display, means for transmitting said sensing of the flag removal to a receiver coupled to the spectator viewed video display, a marker generator superimposing a rules infraction notification on the spectator viewed display upon receiving said sensing of the flag removal from its said normal position, whereby the viewers of the display are made immediately aware of a rule infraction, even though some or all of the players of the two teams may not be so immediately aware of said rule infraction and thereby might and sometimes do continue to play the game or contest in ignorance of the noting of said rule infraction.

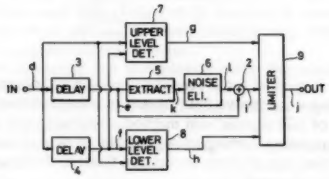


4,541,014

CONTOUR CORRECTING CIRCUIT

Yasuo Yagi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,660
Claims priority, application Japan, Jun. 15, 1982, 57-101336
Int. Cl.³ H04N *5/16*
U.S. Cl. 358—166 **2 Claims**



1. A contour correcting circuit, comprising;

first delay means for delaying an input video signal by a first period of time (t_1);

second delay means for delaying said input video signal by a second period of time (t_2), the second period of time being longer than the first period of time ($t_1 < t_2$);

a high frequency extraction circuit for extracting a high frequency component from an output signal of said first delay means;

an addition circuit for subjecting to addition an output signal of said high frequency extracting circuit and an output signal of said first delay means;

an upper level detecting circuit for selecting the larger in level of said input video signal and an output signal of said second delay means;

a lower level detecting circuit for selecting the smaller in level of said input video signal and an output signal of said second delay means; and

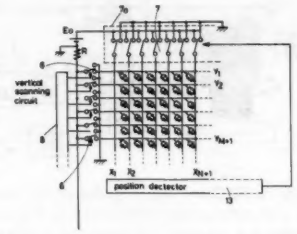
amplitude limiting means for eliminating an addition circuit output signal which is larger than the level of an output signal of said upper level detecting circuit and an addition circuit output signal which is smaller than the level of an output signal of said lower level detecting circuit.

4,541,015

TWO-DIMENSIONAL IMAGE READOUT DEVICE

Masataka Itoh, Tenri, and Shohichi Katoh, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 15, 1984, Ser. No. 580,386
Claims priority, application Japan, Feb. 15, 1983, 58-24307; Mar. 3, 1983, 58-35608
Int. Cl.³ H01M *3/14*
U.S. Cl. 358—212 **9 Claims**



1. A two-dimensional image readout device comprising:

a sensor device including an insulating substrate, a plurality of parallel Y electrodes of conductive material, a plurality of X electrodes of conductive material disposed in a direction normal to said Y electrodes with a spacing therebetween, and a photoconductive layer interposed in said spacing between said Y and X electrodes, at least one of said Y and X electrodes being made of transparent material;

an optical system including a lens for directing to a surface of said sensor device an image portion to be read out, said image portion being selectively directed by said lens onto a region of one X electrode at a time;

means for moving said optical system and said lens thereof along a path normal to said X electrodes to sequentially align said image portion with each respective X electrodes along said path;

position detector means for detecting when the lens of said optical system is aligned with a respective one of said X electrodes and for identifying which X electrode is aligned with said lens;

power supply means for supplying voltage to a selected portion of said photoconductive layer; and

switch means for selectively connecting said voltage to the X electrode identified by said position detector means to read out an image portion in said photoconductive layer aligned with the identified X electrode.

4,541,016

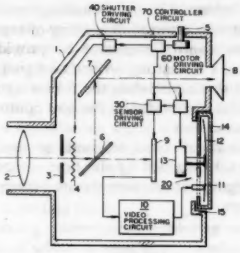
SOLID STATE IMAGE PICKUP DEVICE

Shigeyuki Ochi, Machida, and Seisuke Yamanaka, Mitaka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1982, Ser. No. 454,367
Claims priority, application Japan, Dec. 30, 1981, 56-212055
Int. Cl.³ H04N *3/15*
U.S. Cl. 358—228 **14 Claims**

1. In a solid state image pickup unit for producing a still image with a solid state image sensor having interspersed photosensitive regions for first-field picture elements and other photosensitive regions for second-field picture elements, the improvement comprising an optical shutter for opening or closing the optical path of incident light so as to control an exposure time of said first and second field picture elements,

wherein said first-field and second-field images are picked up simultaneously by said photosensitive regions with said shutter



opened, and the charges from a first-field and a second-field signal are read out sequentially with said shutter closed.

4,541,017

APPARATUS FOR CONTACT-FREE MEASUREMENT OF ELECTRICAL CHARGE IMAGES GENERATED BY ELECTRO-RADIOGRAPHIC RECORDING METHODS

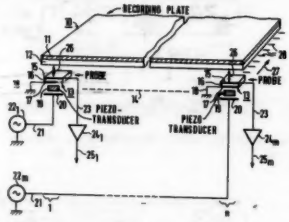
Ingmar Feigt, Erlangen, and Wolfram Wersing, Kirchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 513,011

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1982, 3228833

Int. Cl.³ H04N *1/02*

U.S. Cl. 358—295 **14 Claims**



1. An apparatus for contact-free measurement of an electrical charge image disposed on a surface of a recording plate of the type generated by electro-static recording methods, said apparatus comprising:

a probe matrix having a plurality of discrete Kelvin probes, each probe having an electrode for reacting to the effect of electrostatic induction caused by said charge image, said electrodes respectively generating corresponding image signals for processing; and

a means for inducing mechanical oscillation between said electrodes and said charge image.

4,541,018

DROPOUT COMPENSATION AND CHROMINANCE SUBCARRIER FREQUENCY CONVERSION CIRCUIT IN A VIDEO SIGNAL REPRODUCING APPARATUS

Yasuaki Watanabe, Kasukabe, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 6, 1981, Ser. No. 318,945

Int. Cl.³ H04N *9/491*

U.S. Cl. 358—314 **3 Claims**

1. A dropout compensation and chrominance subcarrier frequency conversion circuit in a video signal reproducing apparatus, said reproducing apparatus reproducing a pre-recorded composite color video signal from a recording medium, said pre-recorded composite color video signal comprising a luminance signal which is band-limited in the high frequency part thereof to occupy a predetermined frequency band and a carrier chrominance signal which is frequency-converted into a low frequency band to be band-share-multiplexed with the high frequency part of the band-limited luminance signal, said dropout compensation and chrominance subcarrier frequency conversion circuit comprising:

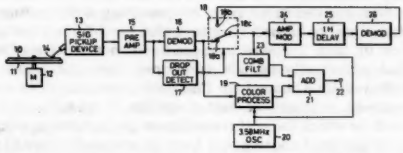
amplitude modulator means for amplitude-modulating a carrier by a composite color video signal which is reproduced from said recording medium;

delay circuit means for delaying an amplitude-modulating signal from said amplitude modulator means by a predetermined delay time, said delay circuit means having a frequency band which only passes a signal in a predetermined frequency band between a frequency band part of a carrier chrominance signal which exists in the high frequency part of an upper side band of said amplitude-modulated signal and a frequency band part of a carrier chrominance signal which exists in the low frequency part of a lower side band of said amplitude-modulated signal;

demodulating circuit means for demodulating an output amplitude-modulated signal of said delay circuit;

detecting circuit means for detecting a dropout in the reproduced composite color video signal;

switching circuit means switched over in response to an output of said detecting circuit, said switching circuit being switched to supply the reproduced composite color



video signal to said amplitude modulator means in the absence of a detected dropout in said detecting circuit, and to supply an output signal of said demodulating circuit means to said amplitude modulator means in the presence of a detected dropout in said detecting circuit;

eliminating means for eliminating from an output signal of said switching circuit means the carrier chrominance signal which exists in the high frequency part of the band-limited luminance signal;

carrier chrominance signal processing means for subjecting the reproduced composite color video signal to a predetermined signal processing, said predetermined signal processing including a frequency conversion of the carrier chrominance signal back to an original frequency band thereof before it was frequency-converted into the low frequency band for recording; and

adding means for adding an output luminance signal of said eliminating means and an output carrier chrominance signal of said carrier chrominance signal processing means, and for producing a color video signal;

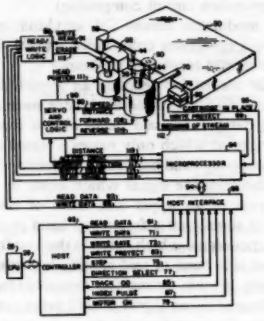
said chrominance signal processing means including a single oscillator which produces a predetermined signal having a frequency equal to an original chrominance subcarrier frequency of the carrier chrominance signal before it was frequency-converted into the low frequency band for recording,

said predetermined signal produced from said oscillator being used for the frequency conversion in said carrier chrominance signal processing means, and being supplied to said amplitude modulator as said carrier.

4,541,019
RECORDING SYSTEM FOR RECORDING DATA ON TAPE IN A DISK-RECORDING FORMAT

Normand E. Precourt, San Diego, Calif., assignor to Cipher Data Products, Inc., San Diego, Calif.

Filed Nov. 26, 1982, Ser. No. 444,712
Int. Cl.[3] G11B 5/86
U.S. Cl. 360—15 2 Claims



1. A recording tape data recording system for connection to a host controller of a floppy disk data recording system for recording data in a stream on a recording tape in the same format that data is recorded on a floppy disk by the floppy disk data recording system, wherein the host controller is operable in a formatting mode in which the host controller responds to a first-received index pulse by providing a formatting write data signal to record a segment that has a format including a first fill field, followed by a predetermined number of sectors that individually include an address field and a data field, followed by a second fill field until a second index pulse is received, wherein the host controller is operable in a write mode in which the host controller responds to recognition of a predetermined address read from an accessed recorded sector by providing a recording write data signal to write data in the data field of the accessed sector, and wherein the host controller provides a write gate signal simultaneously with the provision of either write data signal; said recording tape data recording system comprising

a read/write transducer head for connection to the host controller for reading data from the tape stream, or writing data in the tape stream, or erasing in the tape stream;

transport means for transporting the tape past the transducer head to cause the transducer head to access a stream on the recording tape;

first sensing means for sensing a beginning-of-stream indicator on the recording tape;

second sensing means coupled to the transport means for sensing the length of tape transported past the transducer head; and

a control processor for connection to the host controller and coupled to the transducer head and the first and second sensing means for responding to the first sensing means sensing the beginning-of-stream indicator (a) by providing an erase command to the transducer head for causing an initial gap to be erased in the tape stream adjacent the beginning-of-stream indicator and (b) by next providing an initial beginning-of-segment index pulse to the host controller, and for responding to the combination of (a) the write gate signal from the host controller that is provided simultaneously with the formatting write data signal and (b) the second sensing means sensing that the length of tape transported past the transducer head following provision of a beginning-of-segment index pulse corresponding to the length of a concentric track on a said floppy recording disk (a) by providing an end-of-segment index pulse to the host controller, (b) by next providing an erase command to the transducer head for causing an inter-segment gap to be erased in the tape stream and (c) by finally providing another beginning-of-segment index pulse to the host controller;

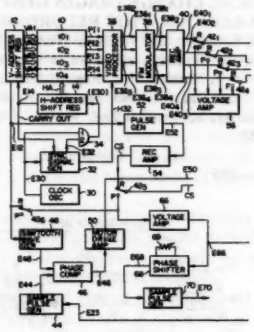
whereby, when operated in the formatting mode, the host controller responds to each beginning-of-segment index pulse from the control processor by providing to the transducer head a formatting write data signal for recording a segment that ends when the following end-of-segment index pulse is provided to the host controller by the control processor; and

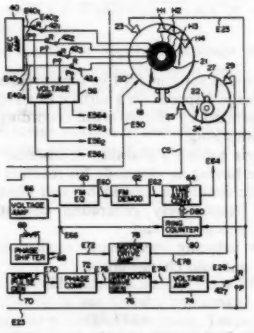
wherein the transducer head responds to the formatting write data signal provided by the host controller by recording the segment in the tape stream between consecutive erased gaps.

4,541,020
DATA RECORDING/REPRODUCING APPARATUS

Kenji Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1982, Ser. No. 396,779
Claims priority, application Japan, Jul. 22, 1981, 56-114625
Int. Cl.[3] H04N 5/782; G11B 21/04
U.S. Cl. 360—22 36 Claims





1. A data recording/reproducing apparatus, comprising:

signal source means for providing a plurality of different recording signals cooperatively forming a specific data, said signal source means including a solid-state image pickup device comprising at least two imaging blocks containing a plurality of photoelectric cells, and wherein said solid-state image pickup device provides picture data corresponding to said specific data and the picture data of each of said imaging blocks corresponds to each of said recording signals;

recording means coupled to said signal source means for recording said recording signals into a plurality of recording tracks formed in a recording medium so that said recording signals are parallel recorded simultaneously in the plurality of recording tracks, wherein the number of recording tracks corresponds to the number of said recording signals; and

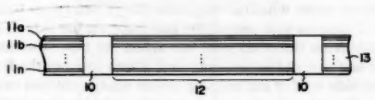
reproducing means coupled to said recording medium for sequentially reproducing from one of said recording tracks a reproducing signal corresponding to one of said recording signals and for converting said recording signals recorded in parallel fashion into serial reproduced signals, said sequential reproducing being carried out for every recording track;

said recording means includes rotating recording heads the number of which is equal to the number of said recording signals, said reproducing means includes a single rotating reproducing head, said rotating recording heads simultaneously record the plurality of said recording signals into said recording tracks of the same number as that of said rotating recording heads, and said rotating reproducing head sequentially reproduces the contents in said recording tracks recorded by said rotating recording heads.

4,541,021
ELECTRONIC STILL CAMERA

Masahiro Konishi, Minami-ashigara, and Makoto Murakoshi, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 13, 1982, Ser. No. 407,873
Claims priority, application Japan, Aug. 14, 1981, 56-127405
Int. Cl.³ G11B *27/00*; H04N *5/782*
U.S. Cl. 360—35.1 **12 Claims**



1. An electronic still camera, comprising:

an optical system;

a photoelectric conversion unit including a sensor for converting an optical image from the optical system into electrical signals corresponding to image data;

a magnetic recording unit, operatively connected to the photoelectric conversion unit, for recording the image data from the photoelectric conversion unit on a magnetic tape, the magnetic tape being preformatted with tape marks to have a plurality of record units of a fixed length, each record unit corresponding to one frame, the magnetic recording unit recording still pictures on photographing units including a single frame, the record area preceeding each photographing unit being a non-record area used as a start and stop area for starting and stopping the magnetic tape;

a format signal detector for detecting the tape marks on the magnetic tape;

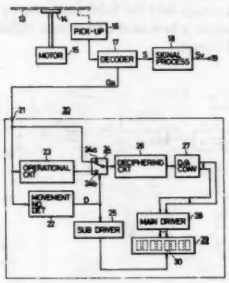
a controller, operatively connected to the format signal detector, for controlling the magnetic recording unit so as to record the image data in the area of each record unit of the magnetic tape in accordance with the signal detected by the format signal detector; and

a magnetic tape drive unit, operatively connected to the format signal detector and the controller, for driving the magnetic tape for recording and stopping the magnetic tape after recording.

4,541,022
DEVICES FOR DISPLAYING ADDRESSES ON A RECORD MEDIUM

Akira Katsuyama, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 10, 1983, Ser. No. 503,307
Claims priority, application Japan, Jun. 21, 1982, 57-106526
Int. Cl.³ G11B *15/52*
U.S. Cl. 360—72.2 **6 Claims**



1. A device for displaying time indications corresponding to address information recorded with program information in a plurality of successive recorded portions on a record medium, each of said recorded portions containing, at a beginning part thereof, a pause division where no program information is recorded, comprising;

means for obtaining from said record medium successive reproduced address information composed of positional information and time information,

information discriminating means for detecting said pause division by discriminating said reproduced address information, and for producing an output indicative of when said pause division is detected,

address information reforming means for modifying said time information contained in said reproduced address information and for producing reformed address information composed of modified time address information and said positional information contained in said reproduced address information,

display means for displaying time indications selectively based on either said reformed address information or said reproduced address information, and

control means responsive to said output from said information discriminating means for controlling said display means to display thereon said time indication based on the reformed address information with a distinguishing mark added thereto when said pause division is detected by said information discriminating means, and to display thereon said time indication based on the reproduced address information when said pause division is not detected by said information discriminating means.

4,541,023
RESOLVER WITH SEQUENTIAL FREQUENCY AND PHASE CORRECTION

Michael L. Collette, San Francisco, Calif., assignor to Otari Electric Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1983, Ser. No. 474,693
Int. Cl.³ G11B *15/52, 27/00*
U.S. Cl. 360—73 **17 Claims**

1. Apparatus for adjusting the speed of recording media moving past a playback device such that the frequency of a reference signal provided by the media is in synchronism with a master signal, comprising:

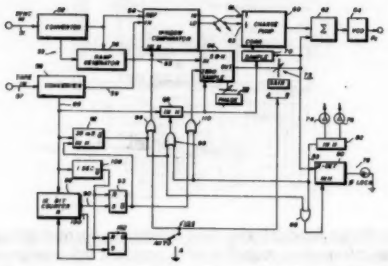
a first frequency-to-voltage converter coupled to said playback device and responsive to said reference signal for generating

a first voltage having a magnitude proportional to the frequency of said reference signal;

a second frequency-to-voltage converter responsive to said master signal and generating a second voltage having a magnitude proportional to the frequency of said master signal;

comparator means responsive to said first and second voltages for detecting the difference between said first and second voltages and for generating a difference signal corresponding to the difference therebetween;

means for detecting when said difference signal is within a predetermined range and for inhibiting the operation of said comparator means when said difference signal is within the predetermined range;



a storage device having first and second input means, said difference signal being coupled to said first input means, and means for detecting when said comparator is inhibited and for applying a voltage to said second input means when said comparator means is inhibited, said storage device storing a signal at its output having a magnitude proportional to the voltage which has been applied to said first and second input means; and

a summing amplifier having a first input connected to the output of said storage device; the output of said summing amplifier being coupled to means for driving said recording media past said playback device at said adjusted speed.

4,541,024

MAGNETIC-TAPE GUIDE ARRANGEMENT FOR A CASSETTE AND A MAGNETIC-TAPE CASSETTE APPARATUS

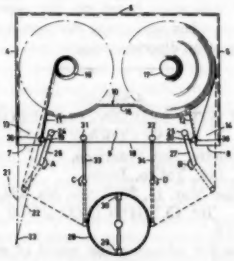
Joannes H. F. C. Sieben, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,842

Claims priority, application Netherlands, Mar. 11, 1982, 8201009

Int. Cl.[3] **G11B** *15/66, 5/52, 23/04*

U.S. Cl. 360—85 **9 Claims**



1. A magnetic-tape cassette for use with a magnetic-tape cassette apparatus comprising tape-extraction means which, when a cassette is in position on the apparatus, are operable to draw a loop of tape from the cassette for cooperation with a magnetic head or heads on the apparatus, the cassette comprising a housing having two parallel major walls and two side walls and a rear wall which extend between the major walls at the peripheries thereof, two reel hubs which are rotatable in the housing about axes perpendicular to the major walls of the housing and which carry a magnetic tape, the tape being secured at its ends to the hubs and being unwound from one hub and wound onto the other hub in the operation of the cassette apparatus, two apertures in the front of the housing through which the tape leaves and re-enters the housing while travelling from one reel hub to the other, two tape supports each of which defines a part of the boundary of an associated one of said apertures and which, when the cassette is not in use, support a portion of the tape that extends across the front of the housing externally thereof between said apertures, the tape inside the housing then extending directly between each tape support and an associated one of the reel hubs, and a recess formed in the front of the housing between said apertures to permit the tape-extraction means of the cassette apparatus, when the cassette is in position on the apparatus, to engage behind said portion of the tape that extends across the front of the housing, the recess being formed by a recess or recesses in the front edge or edges of one or both of the major walls of the housing and being bounded by a wall which extends between said major walls and which has two side portions and an intermediate portion extending between the side portions, each of these side wall portions and the adjacent side wall of the housing bounding a passage in the housing through which the tape passes and which terminates in a respective one of the apertures, characterized in that each of said tape supports is formed integrally with an associated one of said side wall portions at the end thereof which is remote from said intermediate wall portion, and each of said apertures is bounded on one side by the respective tape support and on the opposite side by the front end of the adjacent side wall of the housing, and in that a first plane which is tangential to one of the reel hubs on the side thereof remote from the other reel hub and which touches the tape support associated with said one of the reel hubs, and a second plane which is tangential to the outermost turn of the roll of tape on said one of the reel hubs on the side of the roll remote from the other reel hub when the tape is wound fully onto said one of the reel hubs and which touches the front end of the side wall of the housing which is adjacent said one of the reel hubs, intersect one another outside the housing at the front thereof, and a third plane which is tangential to said other reel hub on the side thereof remote from said one of the reel hubs and touches the tape support associated with said other reel hub, and a fourth plane which is tangential to the outermost turn of the roll of tape on said other reel hub on the side of the roll remote from said one of the reel hubs when the tape is wound fully onto said other reel hub and which touches the front end of the side wall of the housing which is adjacent said other reel hub, intersect one another outside the housing at the front thereof.

4,541,025

CONTROL ROD FOR CLUTCH ACTUATOR FOR FLOPPY DISK DRIVE

Pawitter S. Sidhu, 2900 Corda La., Bel Air, Calif. 90049, and Gary M. Delgado, 1745 Carmelina Ave., Los Angeles, Calif. 90025

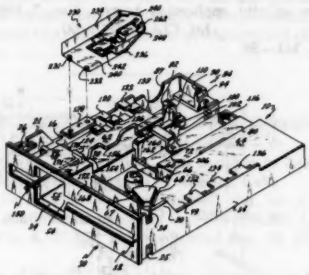
Filed Sep. 29, 1982, Ser. No. 427,597

Int. Cl.[3] **G11B** *5/016, 5/012*

U.S. Cl. 360—99 **8 Claims**

1. In a diskette drive assembly having a chassis frame and a channel to receive the diskette having a central opening, means including a driving spindle and drive cone cooperating with the spindle, the improvements comprising means mounting the drive cone for vertical movement relative to the chassis frame, control rod means mounted over the chassis frame and having an end extending from the front of the chassis frame, means for moving the driving cone relative to the spindle having loaded

and unloaded positions, the said last means having a part engageable with the said control rod for movement between the loaded and unloaded position said part including an elongated actuation spring in a position normal to the said rod and having



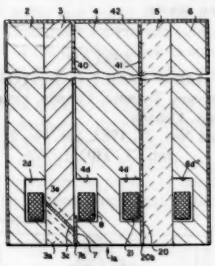
and end portion connected to the driving cone, said control rod having a lobe positioned to be engageable with said actuation spring, the said actuation spring having formations in it engageable with said lobe of the driving rod which establish loaded and unloaded positions of the driving cone.

4,541,026

HYBRID READ-WRITE HEAD FOR PERPENDICULAR RECORDING MEDIA

Wayne A. Bonin, Cedar, and Matthew P. Dugas, Minneapolis, both of Minn., assignors to Vertimag Systems Corporation, Minneapolis, Minn.

Filed Jul. 20, 1982, Ser. No. 400,078
Int. Cl.³ G11B *5/27, 5/28, 5/20, 5/16*
U.S. Cl. 360—121 **16 Claims**



1. A read-write head for use with a perpendicular recording medium, comprising prefabricated elongated members secured together in face-to-face relationship to form a unitary structure having an end adapted to be proximate to said recording medium during use, a first said member having a non-magnetic end portion adjacent said proximate end of said head and a magnetic portion extending away from said non-magnetic end portion, said head further comprising:

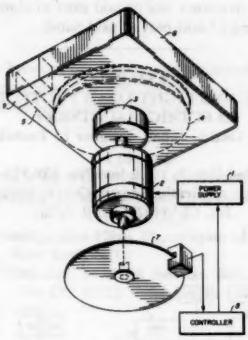
(a) read-write means for selectively reproducing and recording information on said recording medium, comprising pole-piece means between said first member and a said member secured thereto and first electrical coil means in operative association with said pole-piece means, said pole-piece means comprising a first elongated thin film layer of a magnetic material carried by and extending longitudinally along a face of said first member, said first thin film layer overlying said non-magnetic end portion of said first member and extending onto said magnetic portion and having a pole-tip end immediately adjacent the non-magnetic end portion of said first member at said proximate end, the thickness of said pole-tip end being operable to establish the resolution of said head when said head is used for reproducing said information.

4,541,027

METHOD OF FORCE/ACCELERATION REEL TAPE SIZING

Kenneth D. Danielsen, and Daniel J. Winarski, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 13, 1982, Ser. No. 434,030
Int. Cl.³ G11B *15/18*
U.S. Cl. 360—137 **30 Claims**



1. In a magnetic tape drive, a method of checking the amount of tape wound on a hub of a reel comprising the steps of:

holding the free end of the tape wound on the hub;

rotating the hub in a direction to wind the tape;

rotating the hub for a predetermined period of time with a predetermined torque in a direction to unwind the tape from the hub;

determining the rotational distance traveled by the rotated hub in the unwind direction for the set period of time; and

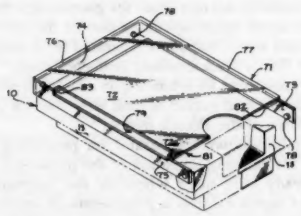
indicating the amount of tape on the hub as a result of the determined rotational distance traveled for the set period of time due to the inertia of the tape and associated parts.

4,541,028

HAND-HELD TRANSDUCING DEVICE FOR INSERTABLE RECORDS

Reynold B. Johnson, 548 E. Cresent Dr., Palo Alto, Calif. 94301

Filed Dec. 4, 1981, Ser. No. 327,365
Int. Cl.³ G11B *23/02, 3/58, 3/00, 3/10*
U.S. Cl. 360—137 **3 Claims**



1. In a hand-held transducing device for transducing information signals relative to a stationary record carried on a sheet of material having at least one pair of mutually perpendicular

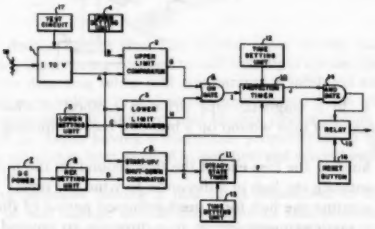
side edges, a housing small enough to be readily held in one hand, a movable transducer carried by said device for tracing a predetermined information path on the record, and means for holding a record in stationary transducing relation to said transducer, the last named means including a panel, means supporting said panel in predetermined spaced relation with respect to said transducer, passage means for admitting the sheet into the spacing defined between said panel and said transducer, and means carried by said panel for engaging said pair of side edges of the sheet to register the predetermined information path of the record with respect to said transducer, said passage means including slots respectively defined along substantially mutually perpendicularly adjacent sides of said panel, that part of said panel disposed between said adjacent slots being free to permit one of said slots to continue into the other upon lifting of said part of said panel.

4,541,029

OVER-LOAD AND LIGHT-LOAD PROTECTION FOR ELECTRIC MACHINERY

Akira Ohyama, Osaka, Japan, assignor to Tsubakimoto Chain Co., Japan

Filed Oct. 3, 1983, Ser. No. 538,376
Claims priority, application Japan, Oct. 6, 1982, 57-174505
Int. Cl.³ H02H *3/10, 7/08*
U.S. Cl. 361—31 **9 Claims**



1. An apparatus for protecting machinery driven by electric motors from operating during over-load and light-load conditions, comprising:

inductive means, operatively associated with an electrical supply line for the induction motor, for generating a control signal having a magnitude proportional to current flowing in the supply line;

an upper limitation magnitude comparator for generating an over-load signal output whenever the magnitude of the control signal exceeds a predetermined upper safety value;

a lower limitation magnitude comparator for generating a light-load signal output whenever the magnitude of the control signal is less than a predetermined lower safety level;

an inhibitable protection timer for producing a fault persistence output signal whenever one of the over-load and light-load signal outputs is generated for a period of time longer than a predetermined protection time;

a steady state timer for inhibiting an enable output signal for a predetermined period of time after start-up and during shut-down of the electric motor;

a start-up/shut-down comparator for producing an output signal for enabling operation of the protection timer and the steady state timer whenever the magnitude of the control signal exceeds a predetermined reference value corresponding to an electric current lower than the unloaded current of the electric motor; and

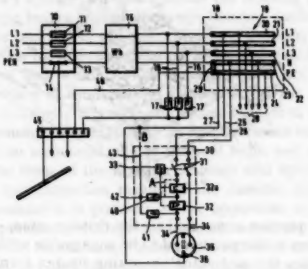
an output relay for interrupting operation of the electric motor when both the protection timer and the steady state timer produce time coincident output signals.

4,541,030

PROTECTIVE ELECTRIC HOUSE-WIRING SWITCH

Gottfried Biegelmeier, Vienna, Austria, assignor to Brown, Bovery & Cie Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,880
Claims priority, application Austria, Nov. 2, 1982, 3989/82
Int. Cl.³ H02H *9/00*
U.S. Cl. 361—56 **16 Claims**



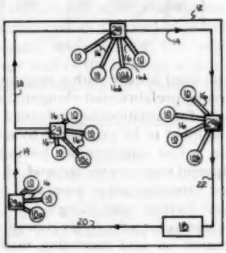
1. Protective house-wiring switch with an overcurrent tripping device in a housing containing terminals for phase conductors and a neutral conductor, contacts for interrupting at least the phase conductors, at least one switch latch having at least one device connected to the respective phase conductors for actuating the contacts to interrupt the phase conductors, comprising two overvoltage arresters for each phase conductor connected in cascade in direction of energy flow within the housing, one of said two overvoltage arresters being connected to the respective phase conductor ahead of said contact actuating device, and the other of said two overvoltage arresters being connected to the respective phase conductor after said contact actuating device.

4,541,031

LOOP FAULT ISOLATOR

David N. I. Ibbetson, Toronto, Canada, assignor to Derek W. Moore, Rexdale, Canada

Filed Nov. 21, 1983, Ser. No. 554,065
Int. Cl.³ H02H *7/26*
U.S. Cl. 361—67 **15 Claims**



1. A method for locating, and isolating and by-passing a defective electrical device in an electrical circuit, and comprising the steps of;

sensing current and voltage at a first point in such circuit, on one side of such device, whereby the current and voltage at said first point are not significantly altered by the sensing process;

sensing current and voltage at a second point in such circuit, on the other side of such device, whereby the current and

voltage at said second point are not significantly altered by the sensing process;

comparing such currents and voltages at said two points;

creating a control signal responsive to such compared currents and voltages, and,

isolating such device from such circuit, and thereafter re-establishing such circuit whereby to by-pass such device, in response to a control signal of predetermined characteristics.

4,541,032

MODULAR ELECTRICAL SHUNTS FOR INTEGRATED CIRCUIT APPLICATIONS

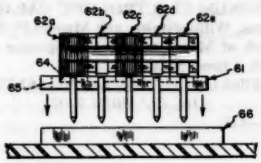
Pierre P. Schwab, Port St. Lucy, Fla., assignor to B/K Patent Development Company, Inc., Los Angeles, Calif.

Division of Ser. No. 384,938, Jun. 4, 1982, Pat. No. 4,427,851, which is a continuation-in-part of Ser. No. 199,354, Oct. 21, 1980, Pat. No. 4,356,361. This application Dec. 21, 1983, Ser. No. 563,787

The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.

Int. Cl.³ H02B *1/00*; H05K *7/10*

U.S. Cl. 361—331 **4 Claims**



1. A ganged modular electrical shunt comprising:

a multiplicity of electrically insulating, substantially rectangular housing blocks, each block including a base, a top, and two end walls, and a pair of elongated, electrically conducting terminals secured to and extending outwardly from the base of the housing block in substantially mutually parallel spaced relationship; said ganged shunt being further characterized in that:

each housing block has a dove-tail shaped portion extending from the outer surface of the base wall between two electrically conducting terminals and is slidably engaged thereby with a mounting bar having a groove correspondingly shaped to match the profile of the dove-tail shaped portions of the housing blocks and to receive said dove-tail shaped portions.

4,541,033

POWER SWITCH ASSEMBLY HAVING A CIRCUIT BREAKER AND A CIRCUIT DISCONNECTOR

Toru Saito, Nishinomiya, Japan, assignor to S. Soga & Co., Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 560,990

Claims priority, application Japan, Dec. 16, 1982, 57-222509; Apr. 29, 1983, 58-76706

Int. Cl.³ H02B *5/00*

U.S. Cl. 361—333 **9 Claims**

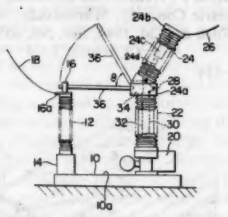
1. A power switch assembly comprising:

a. a horizontal supporting base;

b. a first supporting porcelain insulator disposed on said base so as to extend vertically upward to a free first upper end thereof;

c. a second supporting porcelain insulator disposed on said base horizontally spaced from said first insulator so as to extend vertically upward to a free second upper end thereof;

d. a circuit disconnector, including a stationary contactor and a terminal disposed on said first free end and an elongated movable contactor having a third free end, mounted on said second free end such that said third free end is disengagably engagable with said stationary contactor; and



e. a circuit breaker, adjacent to and electrically connected to said circuit disconnector, including a breaking portion mounted on said second free end.

4,541,034

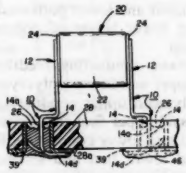
ELECTRICAL TERMINAL AND METHOD OF SECURING SAME IN CIRCUIT SUBSTRATE THRU-HOLE

William J. Fanning, Glen Ellyn, Ill., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Apr. 26, 1984, Ser. No. 604,297

Int. Cl.³ H01R *9/00*; H05K *1/00*

U.S. Cl. 361—405 **20 Claims**



1. An electrical terminal of the thru-hole insertion type, which comprises:

an upper shank portion adapted for establishing an interconnection with an associated circuit element; and

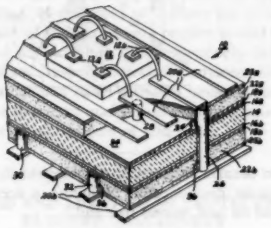
a lower integral shank portion including a thru-hole insertion section formed with at least one upwardly extending free-ended tab, said tab being oriented in the major plane of said lower shank portion until after insertion thereof within an associated substrate-formed thru-hole, said lower shank portion having a maximum width dimension that is less than the diameter of an associated thru-hole into which it is to be inserted, and further having stop means for positioning the upper free end of said tab at an elevation ranging from only slightly above to appreciably below the upper open end of such associated thru-hole, said tab further being dimensioned such that, when thusly positioned, the lower integral end thereof extends at least to the lower open end of the associated thru-hole, with the upper free end of said tab being adapted to be pivoted, when thusly positioned, in a first direction perpendicular to the major plane thereof, against the sidewall of the associated thru-hole in response to a then downwardly protruding end region of said lower shank portion being subsequently clinched in an opposite, second direction against the underside of the associated thru-hole-forming substrate, the upper free end of said tab, when thusly confined and ultimately pivoted, thereby facilitating not only the temporary securement of the terminal within such associated thru-hole, but the establishment thereafter of a reliable, permanent terminal-thru-hole soldered interconnection.

4,541,035

LOW LOSS, MULTILEVEL SILICON CIRCUIT BOARD

Richard O. Carlson; Homer H. Glascock, II; James A. Loughran, and Harold F. Webster, all of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,697
Int. Cl.³ H05K 1/14
U.S. Cl. 361—414 8 Claims



1. A low dielectric loss, multilevel silicon circuit board, comprising:

(a) an inner substrate layer of monocrystalline silicon;

(b) upper and lower insulative layers on upper and lower surfaces of said substrate layer, respectively;

(c) first level upper and lower patterned conductors on said upper and lower insulative layers, respectively;

(d) upper and lower layers of polycrystalline silicon on said upper and lower first level patterned conductors, respectively;

(e) second level upper and lower patterned conductors over said upper and lower layers of polycrystalline silicon, respectively; and

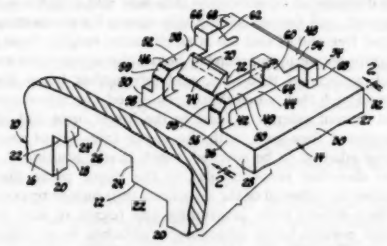
(f) upper and lower conducting feedthroughs extending through said upper and lower polycrystalline silicon layers, respectively, said upper conducting feedthrough interconnecting said upper first and second level patterned conductors and said lower conducting feedthrough interconnecting said lower first and second level patterned conductors.

4,541,036

LATCH FOR TERMINAL BLOCK

Richard V. Landries, Warren, Ohio, and Robert A. Ress, Jr., Tequesta, Fla., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 6, 1984, Ser. No. 628,589
Int. Cl.³ H05K 7/12
U.S. Cl. 361—426 6 Claims



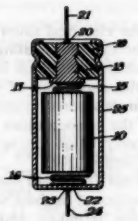
1. In combination with a panel having an aperture therein and a terminal block having a laterally extending leading edge along one side thereof, said terminal block being moveable from one side of said panel into an installed position in said aperture wherein at least a portion of said one side of said terminal block is separated from an adjacent marginal edge of said aperture, a latch comprising, a U-shaped frame including a pair of parallel support arms, guide means on said terminal block at said leading edge rigidly connected to a distal end of each of said parallel arms whereby said frame is supported on said terminal block in cantilever spring fashion generally parallel to said one side of said terminal block and against said aperture marginal edge in said installed position of said terminal block, said guide means defining a smooth lead-in surface to guide said frame under said marginal edge during movement of said terminal block to said installed position, abutment means on said frame engageable on said one side of said panel to limit penetration of said terminal block into said aperture to said installed position, a latch arm supported on said frame in cantilever spring fashion between said parallel support arms, means on a distal end of said latch arm defining a shoulder engageable on the side of said panel opposite said one side in said installed position of said terminal block to prevent withdrawal of said terminal block from said aperture, and means on said distal end of said latch arm defining a ramp extending from above said frame to inboard of said lead-in surface in an unflexed position of said latch arm so that said ramp is the only portion of said latch arm engageable on said aperture marginal edge during movement of said terminal block to said installed position.

4,541,037

ALUMINUM ELECTROLYTIC CAPACITOR

Sidney D. Ross, Williamstown, and Manuel Finkelstein, North Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Oct. 19, 1984, Ser. No. 662,757
Int. Cl.³ H01G 9/02
U.S. Cl. 361—433 5 Claims



1. An aluminum electrolytic capacitor comprising a rolled capacitor section having two electrode foils, one being an anode foil bearing a dielectric oxide and the second being a cathode foil, wound with interleaved spacer material and in contact with an electrolyte having solute dissolved in an organic solvent and containing as additive a soluble, substituted-ammonium dihydrogen phosphate having a cation selected from the group consisting of isopropylammonium, n-butylammonium, dimethylammonium, diethylammonium, diisopropylammonium, triethylammonium, tri-n-propylammonium, and morpholinium cations, said solute having a cation compatible with said phosphate cation.

4,541,038

KNOCKDOWN LAMP ASSEMBLY

Andrew J. Van Noord, 1434 Hillsboro, SE., Grand Rapids, Mich. 49506

Filed Sep. 9, 1983, Ser. No. 531,163
Int. Cl.³ F21V 1/06
U.S. Cl. 362—352 17 Claims

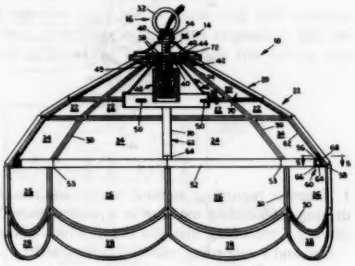
1. In a knockdown lamp assembly having a light fixture adapted to be electrically connected to a power source, shade means comprising a plurality of separate panel sections, and a knock down structural frame assembly mounting the shade means and comprising a central support member, the improvement comprising:

the structural frame assembly further including:

a plurality of elongated interlocking ribs, each having a lower end and an upper end;

lower support means having a substantially annular and continuous configuration separate from the ribs for providing a bracing support for the shade means, and comprising rib and panel section receiving means for detachably receiving and supporting the panel sections and the lower ends of the ribs;

upper rib support means mounted to the central support member and spaced apart from the lower support means for detachably receiving the upper end of each of the ribs; and



holding cap means mounted to the central support member and located above the upper rib support means for detachably retaining upper portions of each of the panel sections; and

wherein each of the panel sections comprises rigidly attached securing means separate from the lower support means and the ribs, and detachably received within the rib and panel section receiving means of the lower support means to support the panel sections and to maintain and lock the lower ends of the ribs within the lower support means.

4,541,039

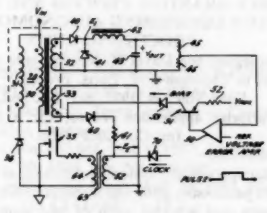
MAGNETICALLY MODULATED D-C TO D-C FORWARD CONVERTER POWER SUPPLY

Steven M. Sandler, Bohemia, N.Y., assignor to Venus Scientific Inc., Farmingdale, N.Y.

Filed Jan. 25, 1984, Ser. No. 573,555

Int. Cl.³ H02P *13/22*

U.S. Cl. 363—21 **13 Claims**



1. A magnetically modulated d-c to d-c feed forward converter comprising:

a source of input d-c voltage;

an output transformer means connected to said source of input d-c voltage, said output transformer means having a primary winding, a reset winding and at least first and second secondary windings;

a switching transistor means connected in series with said primary winding and source of input voltage; said switching transistor means haing a control electrode;

an output rectifier means connected to said first secondary winding and filter means connected to said output rectifier means to produce a filtered output d-c voltage;

clock pulse generator means producing a pulse train for repetitively turning on said switching transistor means;

coupling circuit means for coupling said clock pulse generator means to said control electrode; said coupling circuit means including a saturating transformer core coupled to said second secondary winding and being driven from its residual flux density to saturation flux density by the output voltage of said second secondary winding, whereby said switching transistor means is repetitively turned on for a cycle time starting with a clock pulse from said clock generator means and ending when said saturating transformer core reaches saturation flux density;

said reset winding connected in bypass-circuit relation with respect to said switching transistor means and resetting the flux of said output transformer means following the saturation of said saturating transformer core.

4,541,040

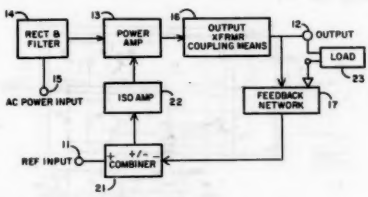
POWER CONVERTING

Lars P. Allfather, Guilderland, N.Y., assignor to Doble Engineering Company, Watertown, Mass.

Filed Nov. 21, 1983, Ser. No. 553,768

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—37 **6 Claims**



1. Power conversion apparatus comprising,

an input terminal for receiving A.C. power from a conventional power line,

power amplifying means for amplifying an input signal,

rectifying and filtering means for direct coupling said power amplifying means to said A.C. power input terminal for providing D.C. energy to said power amplifying means,

an output terminal,

output transformer coupling means for coupling said power amplifying means to said output terminal while providing D.C. isolation from said A.C. power input terminal,

a reference input terminal for receiving a signal for controlling the signal on said output terminal,

feedback means for providing a feedback signal,

combining means for combining a feedback signal from said feedback means with a signal on said reference input terminal to provide a combined signal,

and isolation amplifying means for coupling said combined signal to said power amplifying means while providing D.C. isolation for both said output terminal and said reference input terminal from said A.C. power input terminal.

wherein said isolation amplifying means comprises,

a signal input terminal,

a signal output terminal,

transformer coupled amplifying means,

an optocoupler amplifying means for providing D.C. isolation,

low pass filtering means for selectively transmitting spectral components below a predetermined cutoff frequency,

high pass filtering means for selectively transmitting spectral components above said cutoff frequency,

a combining network coupled to said output terminal having

first and second inputs for providing an output signal representative of the combination of the signals on said first and second inputs,

means including said high pass filtering means and said transformer coupled amplifying means for coupling said input terminal to said first input,

and means including said optocoupler amplifying means and said low pass filtering means for coupling said signal input terminal to said second input,

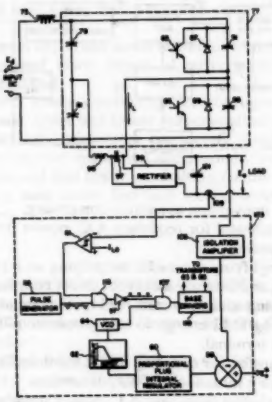
whereby said optocoupler amplifying means and said transformer coupled amplifying means coact to provide D.C. isolation between said signal input terminal and said signal output terminal.

4,541,041

FULL LOAD TO NO-LOAD CONTROL FOR A VOLTAGE FED RESONANT INVERTER

John N. Park, Rexford, and Robert L. Steigerwald, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,065
Int. Cl.³ H02M 1/14
U.S. Cl. 363—41 **6 Claims**



1. A control for a voltage fed series resonant inverter, having controllable switch means which provides a square wave voltage to a resonant series circuit, the output of said inverter coupled to a rectifier to provide dc power to a load, said control comprising:

summer means for comparing a commanded dc voltage to the actual dc output voltage of said inverter and providing an error signal;

oscillator means responsive to said error signal for generating a frequency signal, said oscillator means coupled to said controllable switch means to thereby vary the square wave voltage frequency supplied to said resonant circuit; and

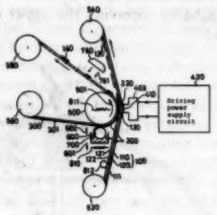
means for controlling the duty cycle of said frequency signal supplied to said controllable switch means so that said frequency signals are supplied in bursts during low load conditions thereby minimizing continuous circulating currents while maintaining the output voltage with low ripple.

4,541,042

TRANSFER RECORDING METHOD AND APPARATUS THEREFOR

Tadao Kohashi, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 11, 1984, Ser. No. 659,956
Claims priority, application Japan, Oct. 14, 1983, 58-192797; Mar. 22, 1984, 59-55424
Int. Cl.³ G01D 15/10
U.S. Cl. 346—76 PH **25 Claims**



1. Transfer recording method comprising the steps of:

driving a recording medium in a predetermined direction,

driving a recording material sheet, which comprises a base film and a recording material layer coated on one face of said base film, in substantially the same direction as that of said recording medium, in a state that the surface of said recording material layer is press-contacting to a face of said recording medium at least at a region whereon recording is to be made,

applying a solvent in liquid state on at least one of said recording material layer and said recording medium, prior to said press-contacting of said surface of recording material layer to said face of said recording medium, said solvent having a lower melting point than a melting-transfer temperature of said recording material layer and such a solubility characteristic as to dissolve at least one component of said recording material, said solubility characteristic being that solubility increases as temperature rises,

heating selected points of said recording material layer to a predetermined temperature thereby thermo-dissolving said selected points of said recording material layer by said solvent which is of or is made to liquid state,

thereby selectively transferring thermo-dissolved selected points of said recording material layer onto said face of said recording medium, during a period of said heating to said predetermined temperature.

4,541,043

RESOURCE GRANTING PROCESS AND DEVICE IN A SYSTEM COMPRISING AUTONOMOUS DATA PROCESSING UNITS

Jean C. Ballegeer, and Duyet H. Nguyen, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 29, 1982, Ser. No. 363,226
Claims priority, application France, Apr. 8, 1981, 8107036
Int. Cl.³ G06F 3/00
U.S. Cl. 364—200 **18 Claims**

1. In a data processing system comprising at least two autonomous data processing units and a resource which may be used by said units and wherein each of said units is assigned an identification number and a priority level for requesting the use of said resource, and wherein each unit is provided with an interface means and a multiple-conductor channel to connect said interface means, a method for granting said resource to at least one of said units in a decentralized manner, comprising the steps of:

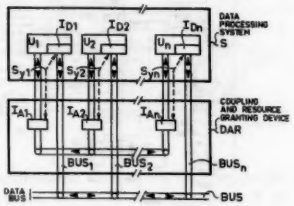
providing communications between said units, said communications consisting of first, second and third conditional control signals each capable of assuming a first or second

logical state, a first binary word representing the priority level of the requesting unit which has the highest priority level, a second binary word representing the identification number of the unit which has been granted the use of said resource,

determining whether any of said units has requested said resource, said request being signaled autonomously by any of said interface means positioning said first conditional control signal in said second logical state,

determining whether said resource has been granted to any of said units, said granting being signaled by the interface means associated with the unit which has been granted said resource positioning said second conditional control signal in said second logical state,

determining whether said unit is requesting said resource while at least one other unit is also requesting said resource thus necessitating a competition run among said



requesting units to determine which unit will be granted said resource, said competition run being signaled by said interface means positioning said third conditional control signal in said second logical state,

inhibiting other requests for said resource during said competition run,

resolving said competition run by sampling said first binary word and calculating whether the priority level of said unit is higher than the priority levels of the other units within said run,

validating the winning unit of said competition run after a predetermined period of time by the interface means associated with said winning unit transmitting said indentification number in said second binary word,

positioning said third conditional control signal in said first logical state to allow new requests for said resource and a new competition run.

4,541,044

LOOP TRANSMISSION WITH BACK-UP POWER SUPPLY FOR THE INTERFACE

Takehiko Shibata, Kokubunji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 433,044, Oct. 6, 1982,. This application Aug. 30, 1984, Ser. No. 646,035

Claims priority, application Japan, Apr. 23, 1981, 56-61869

Int. Cl.[3] **G06F** *15/16*

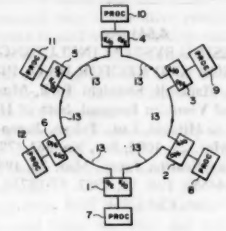
U.S. Cl. 364—200 **6 Claims**

1. An information transmitting system comprising a plurality of terminals and an information transmitting channel for transmitting information between said terminals, wherein each of said terminals comprises:

information processing means;

an interface for connecting said information processing means with said information transmitting channel; and

a back-up power source for initiating supply of electric power at the beginning of each period in which said information processing means is inoperative but the informa-



tion processing means of another said terminal connected to said information transmitting channel is operative.

4,541,045

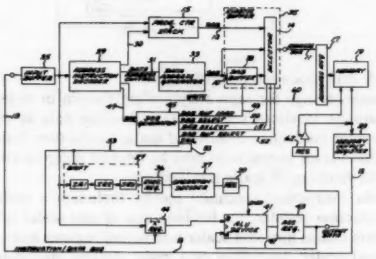
MICROPROCESSOR ARCHITECTURE EMPLOYING EFFICIENT OPERAND AND INSTRUCTION ADDRESSING

Philip F. Kromer, III, Miami, Fla., assignor to Racal-Milgo, Inc., Miami, Fla.

Filed Sep. 21, 1981, Ser. No. 304,017

Int. Cl.[3] **G06F** *9/30*

U.S. Cl. 364—200 **16 Claims**



1. In a computer processor, the structure comprising:

memory means for storing instructions and operands and addressable during each of a series of addressing intervals by one address comprising either an operand address or an instruction address and responsive to an operand address for outputting an operand and to an instruction address for outputting an instruction;

a data bus for conducting the operands and instructions outputted by said memory means;

address instruction decoder means for receiving an instruction from said data bus and for decoding said instruction and providing a data address request signal indicating whether the instruction does or does not require an operand fetch and for providing address control signals;

address generation means for receiving said address control signals from said address instruction decoder means and responsive thereto for producing operand addresses for said memory means and for producing instruction addresses;

means supplied with said operand and instruction addresses and responsive to a first control signal to apply a said instruction address to said memory means, responsive to a second control signal to apply a said operand address to said memory means, responsive to a third control signal to buffer a said operand address thereby producing a buffered operand address, and responsive to a fourth control signal to apply a said buffered operand address to said memory means; and

logic means responsive to said data address request signal for generating said first, second, third and fourth control signals.

4,541,046

DATA PROCESSING SYSTEM INCLUDING SCALAR DATA PROCESSOR AND VECTOR DATA PROCESSOR

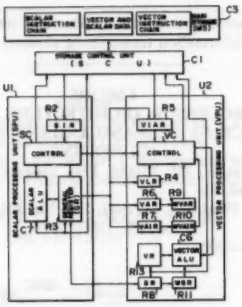
Shigeo Nagashima, Hachioji; Shunichi Torii, Musashino; Koichiro Omoda, and Yasuhiro Inagami, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 361,478

Claims priority, application Japan, Mar. 25, 1981, 56-42314; Sep. 16, 1981, 56-144658; Feb. 10, 1982, 57-18734

Int. Cl.³ G06F 9/18

U.S. Cl. 364—200 **25 Claims**



1. A data processor comprising:

a main storage for separately storing therein in respective storage locations vector data and scalar data as well as vector instruction chains and scalar instruction chains, so that vector instructions may be fetched independently of the fetching of scalar instructions;

scalar instruction execution means, including a scalar instruction register, for fetching one of said scalar instruction chains into said scalar instruction register and one of said scalar data from said main storage, decoding the fetched scalar instructions, executing the decoded instructions and storing scalar data resulting from the execution of the instructions; and

vector instruction execution means, including a vector instruction register, for fetching one of said vector instruction chains into said vector instruction register and one of said vector data, decoding the fetched vector instructions, executing the decoded instructions and writing vector data resulting from the execution of the vector instruction into said main storage;

said scalar instruction execution means including control means for effecting fetching and execution of scalar instructions in sequence regardless of whether or not said vector instruction execution means is operating for the execution of a vector instruction chain, so that said vector instruction execution means and said scalar instruction execution means can operate in parallel, and data supply means responsive to execution of a scalar instruction for supplying to said vector instruction execution means data obtained by scalar processing which is necessary for the execution of the next vector instruction chain following the vector instruction chain currently being executed, so that said data may be supplied to said vector instruction execution means in parallel with the execution of a current vector instruction chain therein, whereby said vector instruction execution means can execute the next vector instruction chain using the data supplied by said data supply means during a time when the scalar instruction execution means fetches and executes the next scalar instruction chain from said main storage.

4,541,047

PIPELINED DATA PROCESSING SYSTEM

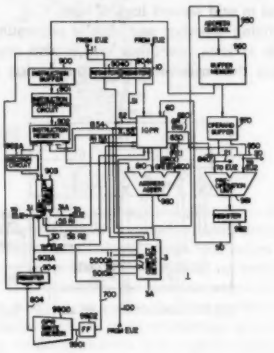
Kenichi Wada, Zama; Yooichi Shintani, Kokubunji; Tsuguo Shimizu, Sayama, and Akira Yamaoka, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 29, 1983, Ser. No. 490,166

Claims priority, application Japan, Apr. 30, 1982, 57-71217

Int. Cl.³ G06F 9/38

U.S. Cl. 364—200 **6 Claims**



1. A data processing system for executing each of a plurality of instructions in a plurality of stages in a pipeline mode, said system comprising:

means for sequentially decoding a plurality of instructions,

a plurality of first register means,

first operation means for executing sequentially operation of the decoded instructions, and writing result of operation of instructions other than a portion of instructions in the result of operation of the decoded instructions to said first register means,

second operation means for executing sequentially operation of said portion of instructions and writing the result of operation to said first register means, said second operation means executing operation of said portion of instructions before said portion of instructions are executed by said first operation means,

means for detecting an interruption, and

means for rewriting, when an interruption is detected, values in said first register means into which result of operation of a succeeding instruction executed by said second operation means has been already stored before execution of interrupted instruction is interrupted.

4,541,048

MODULAR PROGRAMMABLE SIGNAL PROCESSOR

John A. Propster, La Mirada, and John H. Rowan, Fullerton, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 179,188, Aug. 18, 1980, abandoned, which is a continuation of Ser. No. 949,341, Oct. 6, 1978, abandoned. This application Feb. 22, 1982, Ser. No. 350,937

Int. Cl.³ G06F 7/38, 15/00

U.S. Cl. 364—200 **27 Claims**

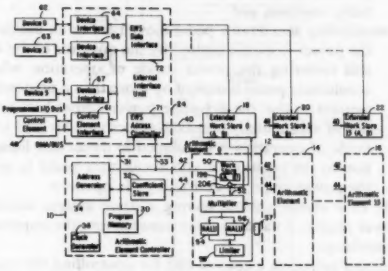
1. A processor system operable with control element means and external device means, comprising:

a plurality of arithmetic elements each including calculating means providing a similar arithmetic operation and including a work store unit for storing a pluralitry of addressable data words, said work store unit being coupled to said

calculating means for transferring data between said work store unit and said calculating means;

an arithmetic element controller coupled to said calculating means and to said work store unit of each of said plurality of arithmetic elements for providing control signals thereto common to all arithmetic elements and work store addresses to said work store units common to all arithmetic elements and for developing extended work store addresses and extended work store control signals;

a plurality of extended work store units for storing a plural-



ity of addressable data words each extended work store unit coupled to the calculating means of an associated arithlmetic element for transferring data between said extended work store unit and said calculating means, and each coupled to said arithmetic element controller for receiving said extended work store addresses and for receiving said extended work store control signals; and

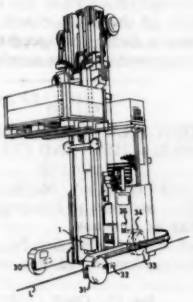
an external interface unit coupled to selectively transfer data from and to said control element means, said external device means, said plurality of extended work store units and said arithmetic element controller.

4,541,049

METHOD FOR UPDATING IN A WHEELED VEHICLE STEERED BY DEAD RECKONING

Sten H. N. Ahlbom, Västra Frölunda, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Oct. 1, 1981, Ser. No. 307,700
Claims priority, application Sweden, Oct. 2, 1980, 8006906
Int. Cl.³ B62D *1/28*
U.S. Cl. 364—424 **3 Claims**



1. In a wheeled vehicle steered by a method of dead reckoning whereby said vehicle computes a position and attitude from rolled off distance measurements, a method for determining said vehicle position and attitude for said dead reckoning method by sensing the vehicle position with respect to a linear marking having a known position in a coordinate system for said vehicle on a surface traversed by said vehicle comprising:

utilizing a linear detector attached to said vehicle in a direction transverse to the direction of movement of said vehicle to measure two consecutive positions of said vehicle with respect to said linear marking, said consecutive positions providing two consecutive intersections between said linear marking and said linear detector;

determining an undeviated rolled off first distance between said consecutive positions;

determining a second distance corresponding to the distance between the points of intersection of said linear detector and said linear marking at said two measured consecutive positions; and,

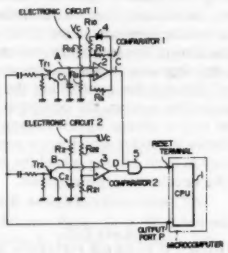
determining from said first and second distances an angle between said linear marking and said vehicle, whereby said vehicle position with respect to said linear marking is known, indicating the vehicle position in said coordinate system.

4,541,050

CONTROL DEVICE FOR A VEHICLE

Masakazu Honda, Kariya; Susumu Harada, Okazaki, and Akio Kobayashi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 358,786, Mar. 16, 1982, abandoned.
This application Dec. 17, 1984, Ser. No. 682,476
Claims priority, application Japan, Mar. 20, 1981, 56-41097
Int. Cl.³ G06F *11/30*
U.S. Cl. 364—424 **6 Claims**



4. A control device for a vehicle, comprising:

microcomputer means, having a reset terminal and an output port, for outputting a pulse signal when said microcomputer means is in a normal operating state, and for outputting a signal of a predetermined constant level when said microcomputer means misoperates;

first electronic circuit means, including a first detecting circuit means for receiving said output signal from said microcomputer means, for detecting a misoperation of said microcomputer means and producing a first detection output signal indicative thereof, said first circuit means further including a charging and discharging circuit means for producing a charging and discharging output signal controlled by said first detecting circuit means;

second electronic circuit means, including a second detecting circuit means for receiving said output signal from said microcomputer means, for detecting misoperation of said microcomputer means and producing a second detection output signal indicative thereof, said second circuit means further including comparator circuit means for comparing said second detection output signal with a reference voltage and for producing a comparison output signal indicative thereof; and

an AND circuit means, responsive to said charging and discharging output signal of said first electronic circuit means and said comparison output signal of said second electronic circuit means, for supplying a disabling opera-

tion signal to said reset terminal of said microcomputer means whenever the duration of said misoperation exceeds a predetermined time period without successful restart of said microcomputer means, whereby the erroneous control of said vehicle is avoided.

4,541,051

ELECTRONICALLY CONTROLLED LAND VEHICLE

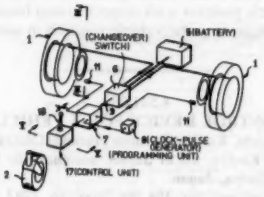
Jean Jarret, and Jacques Jarret, both of 133 avenue du Maréchal Foch, 78130 Les Mureaux, France

Continuation of Ser. No. 283,158, Jul. 14, 1981, abandoned. This application Apr. 5, 1984, Ser. No. 596,579

Claims priority, application France, Jul. 18, 1980, 80 15870

Int. Cl.[3] **G06F** *15/50;* **B62D** *11/04*

U.S. Cl. 364—424 **7 Claims**



1. An electronically controlled land vehicle, comprising at least one pair of side wheels driven by respective electric motors, a source of electrical energy for said electric motors, and a digital computer connected to a reference-clock, said computer having first input means connected to a control unit adapted to provide acceleration instructions for each of said wheels, second input means connected to devices for detecting the relative positions of the stationary and moving portions of the respective driving wheels, and output means connected to input means of elements for controlling the energy supply to the respective electric motors, the computer being adapted to provide on the output means signals responsive to the detection of said relative positions which are a representation of the energy necessary in each driving wheel for having the vehicle comply with the acceleration instructions.

4,541,052

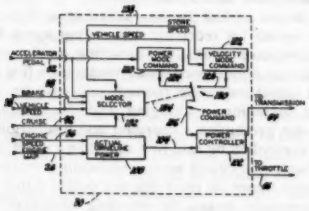
MOTOR VEHICLE POWER OUTPUT REGULATION CONTROL SYSTEM

Dean E. McCulloch, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 20, 1982, Ser. No. 451,195

Int. Cl.[3] **G05D** *13/58;* **B60K** *31/00*

U.S. Cl. 364—431.07 **8 Claims**



1. In a motor vehicle drive system operable in a power mode or a velocity mode including power control means for controlling the power output of said drive system in a manner to bring the same into correspondence with a power command, the method comprising:

developing a power command for said power control means according to the position of an operator manipulated accelerator pedal to thereby establish a power mode of operation wherein the power output of said drive system is varied as a direct and substantially linear function of the accelerator pedal position;

monitoring vehicle operating conditions including accelerator pedal movement and vehicle velocity to determine when such conditions indicate substantially steady state vehicle operation and in response to such determination interrupting the power mode of operation and developing a power command for said power control means as a function of the actual vehicle velocity to thereby establish a velocity mode of operation wherein the vehicle velocity in effect at the establishment thereof is maintained substantially constant; and

monitoring accelerator pedal movement as an indication of the power response desired by the operator of the vehicle and restoring the power mode of operation when the accelerator pedal is moved by more than a predetermined amount so that the driveline power output between periods of substantially constant velocity under said velocity mode of operation is developed in direct and linear relation to the position of said accelerator pedal to produce the power response desired by the operator.

8. In a motor vehicle having a drive system including a power source, a variable ratio transmission, the improvement comprising:

means including a control unit for controlling the operation of the power source and the transmission so as to bring the power output of the drive system into correspondence with a power command;

for operating the vehicle in a power mode of operation in which the power command is developed such that the power output of the drive system is determined as a function of the position of an operator controlled accelerator pedal thereby to provide the power output and corresponding vehicle response desired by the operator;

for operating the vehicle in a constant speed mode of operation wherein the power command is developed such that the speed of the vehicle is maintained substantially constant at the vehicle speed in effect when the constant speed mode of operation is established;

for shifting operation of the vehicle from the power mode of operation to the constant speed mode of operation when the position of the accelerator pedal and the speed of the vehicle are each sufficiently constant for a sufficiently long period of time as to indicate that the operator desires to maintain the vehicle speed then in effect; and

for shifting operation of the vehicle from the constant speed mode of operation to the power mode of operation when the position of the accelerator pedal is subsequently changed to such degree as to indicate that the operator desires to change the speed of the vehicle whereby the power output of the drive system and corresponding vehicle response during the speed change is under the control of the operator via the accelerator pedal.

4,541,053

ELECTRONICALLY CONTROLLED POSTAGE METERING MACHINE AND FREE STAMPING MACHINE

Norbert Knoth, and Friedrich V. Miehe, both of Berlin, Fed. Rep. of Germany, assignors to Francotyp Gesellschaft mbH, Berlin, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,699

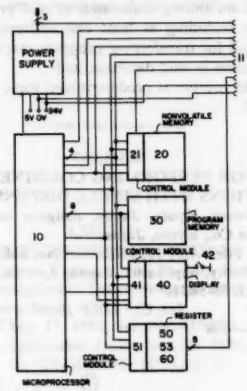
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1981, 3111953

Int. Cl.[3] **G06F** *15/20*

U.S. Cl. 364—466 **13 Claims**

1. Electronically controlled postage metering machine and/or free stamping machine having print rollers and a microprocessor, a non-volatile memory and a register by which adjustment of postage values, date, type of mailing and clearing of a preset value with actually charged postage sum are

effected, comprising peripheral lines and a keyboard respectively connected to the microprocessor, the non-volatile memory and the register for introducing variable information and signals for linkage with preset data stored in the non-volatile memory; respective control modules prestaged to the non-volatile memory, the keyboard and the register for blocking direct access via said peripheral lines to the non-volatile memory; stepping motors for adjusting the print rollers of the postage metering machine, said stepping motors being controllable



both individually and in parallel; the respective control module prestaged to the register having means cooperating with the register for controlling phase adjustment of said stepping motors via non-inverted and inverted outputs of the register, said stepping motors being operable in parallel, and including two driver stages connected thereto for supplying phase control data simultaneously to all of the stepping motors, one of said drivers supplying drive energy only to those stepping motors which have not yet reached the nominal position thereof.

4,541,054

DETERMINING AN OPERATING PATH OF A TOOL IN RELATION TO A THREE-DIMENSIONAL SURFACE OF A WORKPIECE

Alan M. Peck, Beverly, Mass.; David C. Reedman, Grantham, England; Frederick J. Graveling, Aylestone, England; David Moore, Nuneaton, England, and Graham J. Mansfield, Oadby, England, assignors to USM Corporation, Farmington, Conn.

Continuation-in-part of Ser. No. 535,433, Sep. 26, 1983, , which is a continuation of Ser. No. 270,790, Jun. 5, 1981,. This application May 4, 1984, Ser. No. 606,957

Claims priority, application United Kingdom, Jun. 10, 1980, 8019007

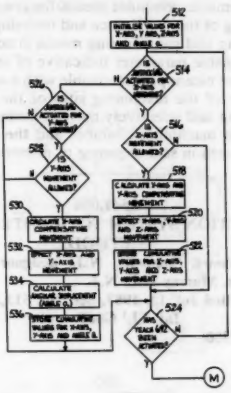
Int. Cl.³ G05B *19/42*

U.S. Cl. 364—474 **5 Claims**

1. In a method of determining an operating path of a tool in relation to a surface of a workpiece wherein a plurality of points of contact between a tool and the workpiece surface are determined and information in the form of digitised co-ordinate axis values relating to each determined point of contact is stored in a computer memory device, from which set of co-ordinate axis values an operating path for the tool can be derived, the improvement consisting in a method for controlling the spacing between adjacent points, said method comprising the steps of:

(i). starting from a point of contact, constituted by a last preceding stored point, of the tool and the workpiece surface, effecting relative movement between the tool and the workpiece surface out of such contact through a predetermined distance along a first axis, and thereafter

(ii). maintaining the tool at said predetermined distance from said starting point of contact while returning the tool and the workpiece surface into contact, which return movement is effected selectively (a) along said first axis, whereupon compensating relative movement is caused to take place automatically along a second axis and/or a third axis such that the tool describes a great circle of a sphere of which the starting point of contact forms the center, or (b) along said third axis, whereupon compensating relative



movement is caused to take place automatically along said second axis such that the tool describes a small circle of such sphere, such return movement being terminated when the next-to-be-stored point of contact of the tool and the workpiece surface is reached, which point of contact is thus spaced at the predetermined distance from the starting point of contact, regardless of the contour of the workpiece surface.

4,541,055

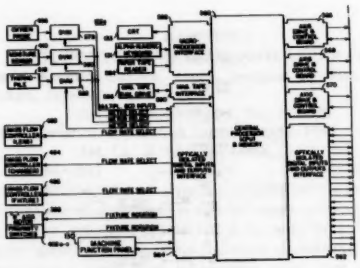
LASER MACHINING SYSTEM

Donald L. Wolfe, Allison Park; Jack W. Clements, Trafford, both of Pa., and John S. Kerrey, Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,241

Int. Cl.³ B23K *26/12;* **G05D** *25/00*

U.S. Cl. 364—474 **35 Claims**



1. Computer controlled apparatus for performing a series of laser machining operations on a work piece in an environment comprised of a gas non-reactive with respect to the material of which the work piece is made, said laser machining apparatus comprising:

(a) a machining chamber for receiving the work piece and for receiving the non-reactive gas to establish a machining environment about the work piece;

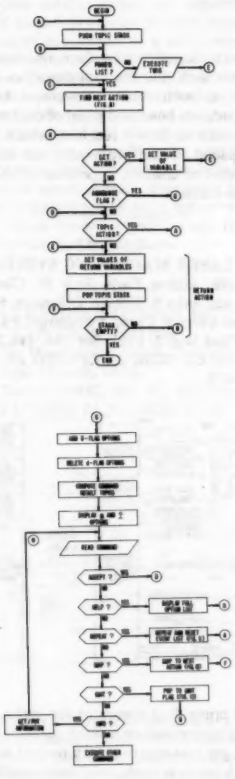
(b) an excitable laser for generating laser emission;
(c) optical means for focusing and directing said laser emission as a laser beam along a path to the work piece;
(d) means for directing the non-reactive gas into said machining chamber at a selected rate;
(e) means for selectively moving said machining chamber and the work piece in a sequence of movements with respect to the laser beam, whereby each of the machining operations is performed on a selected site of the work piece; and
(f) programmable computer means for controlling the laser machining of the work piece and including first means for controlling said gas directing means in accordance with a programmable parameter indicative of said selected rate, and second means programmable with a set of instructions indicative of the machining sites of the work piece for controlling said selectively moving means to sequencially move said machining chamber and the work piece disposed therein in said sequence of movements.

4,541,056

INSTRUCTION SYSTEM TOPIC-INTERPRETING METHOD

Paul G. Matthews, Somerset, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 13, 1983, Ser. No. 513,367
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—300 **19 Claims**



1. In a computer-based system, a topic-interpreting method for delivering instructional material from a database divided into segments to be accessed for display of said material on a screen of a computer-access terminal, said segments being grouped according to topics, said method comprising the steps of

providing an announce routine for placing said terminal in a command mode for at least a predtermined set of commands,

said routine displaying to a student both an announcement that a new topic is about to begin and a notice that the student has an opportunity to select for execution a command from among commands of said predetermined set, said set including at least one address-generic transfer command for transferring program execution to a different location in said database, and

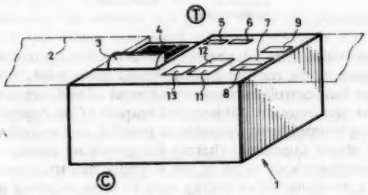
calling said routine at predetermined topic locations in said material.

4,541,057

SYSTEM FOR PERFORMING COMBINED FINANCIAL TRANSACTIONS WITH SINGLE DISPENSING OF CASH

Isamu Hagiwara, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Apr. 15, 1982, Ser. No. 368,815
Claims priority, application Japan, Apr. 16, 1981, 56-58309; Apr. 16, 1981, 56-58310
Int. Cl.³ G06F *15/30*
U.S. Cl. 364—408 **12 Claims**



1. A system for performing financial transactions comprising:

a cash receiving unit comprising a cash inlet, means for receiving cash from said inlet, means for checking the received cash for genuineness, means for accepting cash which is genuine and means for storing accepted cash;

a cash dispenser having a cash outlet for dispensing a specified amount of cash from the outlet;

means for selecting a combination of depositing and/or withdrawing transactions;

keyboard means for manually entering numerical data representing the amounts of money involved in selected depositing and withdrawing transactions;

means for setting the system into a combined transaction service mode and resetting the system out of the combined transaction mode;

a display for displaying transaction information;

processor means responsive to said cash receiving unit, keyboard means, selecting means and setting means, for controlling execution of said selected transactions and operation of said cash dispenser and display, and for determining and storing data representing the amount of cash accepted by said cash receiving unit; and

payment balance memory means for storing the total amount of money to be dispensed at the end of the selected transactions;

said processor means including calculation means for calculating the payment balance and storing the value thereof in said payment balance memory means when the system is set in for combined transaction service mode by adding to the amount stored in the payment balance memory means the amount of accepted cash stored by the cash

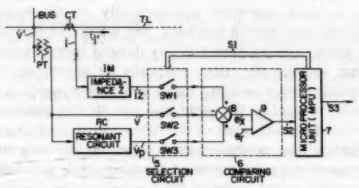
receiving unit and the amount of money to be withdrawn for each withdrawing transaction and subtracting from the amount stored in the payment balance memory means the amount of money to be deposited for each depositing transaction, said processor means further including cash dispenser control means for preventing said cash dispenser from dispensing cash when the system is set for the combined transaction service mode and causing the dispenser to release cash in the sum of the stored payment balance when the system is reset out of the combined transaction service mode.

4,541,058

PROTECTIVE RELAY SYSTEM

Fumio Andow; Mitsuru Yamaura, and Ryotaro Kondow, all of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 17, 1982, Ser. No. 419,473
Claims priority, application Japan, Sep. 30, 1981, 56-153567
Int. Cl.[3] G01R *19/00*; H02H *3/26*
U.S. Cl. 364—483 **14 Claims**



1. A protective relay system comprising:

selection circuit means for receiving a plurality of input signals different one from another in kind which are supplied from a power system to be protected by said protective relay system and for producing output signals selected from said input signals;

comparing means connected to said selection circuit means for receiving said output signals to discriminate whether said output signal is within a predetermined range or not, and to produce at least one discriminated output signal in response to said discrimination; and

data processing means connected to said comparing means for receiving said discriminated output signal to generate at least one protection output signal;

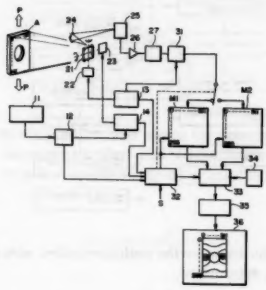
said data processing means including means for controlling said selection circuit means, to time-sequentially alter said output signals from said selection circuit means, means for reading said discriminated output signal from said comparing means in response to a controlled state of said selection circuit means, and means for determining a logical level of said protection output signal in response to a logical level of a second discriminated output signal from said comparing means corresponding to a second controlled state different from a first controlled state of said selection circuit means, and said second discriminated output signal being produced upon lapse of a predetermined time after a logical level of a first discriminated output signal, from said comparing means corresponding to said first controlled state of said selection circuit means, has been changed.

4,541,059

STRESS DISTRIBUTION MEASURING INSTRUMENT

Fukuhara Toshihiko, Hadano, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP81/00365, § 371 Date Aug. 3, 1982, § 102(e) Date Aug. 3, 1982, PCT Pub. No. WO82/01939, PCT Pub. Date Jun. 10, 1982
PCT Filed Dec. 4, 1981, Ser. No. 406,240
Claims priority, application Japan, Dec. 5, 1980, 55-170873
Int. Cl.[3] G01M *7/00*
U.S. Cl. 364—508 **6 Claims**



1. A stress distribution measuring instrument comprising:

infrared radiation detection means for resolving and scanning the surface of an object to be measured to which a periodically varying load is applied and for separately detecting and outputting the quantities of infrared radiation at the maximum and minimum loading times respectively at respective resolved zones of said surface,

calculating means for calculating the difference between the detected quantity of infrared radiation at the maximum loading time and the detected quantity of infrared radiation at the minimum loading time at every resolved zone, and,

display means for visually displaying the values calculated by said calculating means corresponding to the location of the respective resolved zone.

4,541,060

PATH CONTROL METHOD AND APPARATUS

Takashi Kogawa, Sakura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,288
Claims priority, application Japan, Jul. 31, 1982, 57-135172
Int. Cl.[3] B25J *9/00*; G06F *15/46*
U.S. Cl. 364—513 **56 Claims**

1. In a method wherein a path-controlled part is driven by a plurality of arms controlled in and defining a reference coordinate system in which points are designated by at least one angular quantity, a path control method comprising:

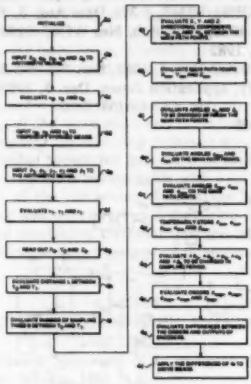
providing a teach point information signal that represents teach points to define a path for the part;

calculating a main path point different from the teach points, from the teach point information signal, said teach points being expressed in a general purpose coordinate system different from said reference coordinate system;

calculating a command signal representing the main path point expressed in the reference coordinate system from the main path point through a coordinate transformation;

calculating in the reference coordinate system an order

expressed in the reference coordinate system and defining a new point along the path from two of said signals; and



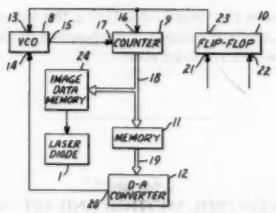
using said order to move the path-controlled part according to the path determined.

4,541,061

DATA CLOCKING CIRCUITRY FOR A SCANNING APPARATUS

David J. Schoon, North Branch, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 13, 1982, Ser. No. 434,189
Int. Cl.[3] H04N *1/22*; G06K *15/12*
U.S. Cl. 364—518 **3 Claims**



1. Clocking circuitry for providing clocking signals in accordance with a preprogrammed sequence of rates including:

an addressable memory for storing data which defines the preprogrammed sequence of rates;

a voltage controlled oscillator for receiving signals based on data obtained from said addressable memory for determining the frequency of operation of said voltage controlled oscillator, said voltage controlled oscillator having an output providing clocking signals at the frequency of operation of said voltage controlled oscillator; and

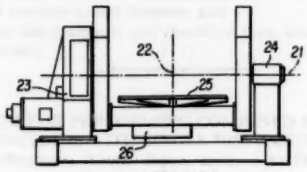
address producing means connected to said output of said voltage controlled oscillator for providing an address signal for each clocking signal provided by said voltage controlled oscillator, said address producing means connected to said addressable memory to address said addressable memory by said address signals for obtaining data from said addressable memory for control of said voltage controlled oscillator.

4,541,062

METHOD OF INTERLOCKINGLY CONTROLLING A ROBOT AND POSITIONER

Hironosuke Kada; Teruyoshi Sekino; Hirogazu Murayama, all of Fujisawa; Iazuaki Tatsumi, Kobe, and Tsudoi Murakami, Ashiya, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 26, 1983, Ser. No. 488,808
Int. Cl.[3] G06F *15/46*; G05B *19/42*
U.S. Cl. 364—513 **4 Claims**



1. A method of interlockingly controlling a robot, having a plurality of shafts, and a positioner with each other and utilizing a teaching roller and a rotatable positioner having a rotating shaft, which comprises:

operating said teaching roller along a weld line of a workpiece fixed to said rotatable positioner;

teaching the position of the weld line;

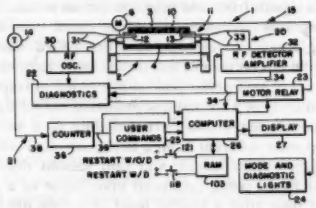
storing the positional data thereby obtained; and performing a welding operation automatically on the basis of the stored data during playback, and which further comprises rotating the positioner at any desired speed during teaching; moving the robot manually or automatically while maintaining a welding torch in a proper welding position with respect to the weld line and storing positional data related to each shaft of the robot and related to a rotating shaft of the positioner each time the teaching roller advances by a predetermined distance, while maintaining the welding speed constant by controlling the moving speed of the robot and the rotating speed of the positioner simultaneously while controlling a relative positional relation between the positioner and the robot on the basis of said positional data related to each shaft of the robot and related to the rotating shaft of the positioner.

4,541,063

METHOD AND APPARATUS FOR UPDATING EVENT INFORMATION

Frank A. Doljack, Pleasanton, Calif., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 24, 1980, Ser. No. 133,595
Int. Cl.[3] G08B *21/00*; G06F *15/46*
U.S. Cl. 364—550 **32 Claims**



1. A monitoring apparatus for monitoring the occurrence of a plurality of events in a cyclical process, comprising event transducer means for detecting the occurrence of such events

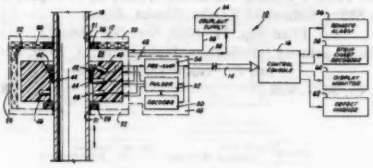
in such process, progress transducer means for detecting the progress of such process, search means for searching for events by sensing whether respective events occur at expected positions in the progress of such process, and self-delete means operative while such process is continuing for automatically preventing said search means from searching for a prescribed event at its expected position when such prescribed event is not sensed during a predetermined number of cycles of such process.

4,541,064

PROCESS FOR ULTRASONIC TESTING OF TUBULAR GOODS

Waylon A. Livingston, 2534 Hollywood, Norman, Okla. 73069

Filed Aug. 11, 1982, Ser. No. 407,147
Int. Cl.³ G06F *15/20*; G01N *29/04*
U.S. Cl. 364—552 **12 Claims**



1. A method for homogeniety testing of linearly movable non-rotating tubular goods using ultrasonic energy, comprising:

directing pulsed ultrasonic energy sequentially from each of a plurality of sources arrayed in equi-spaced disposition around the circumfery of said tubular goods, and directing said pulsed ultrasonic energy continuously as the tubular goods is moved linearly relative thereto, and wherein each of the plurality of sources is pulsed once within a selected frame duration;

receiving returned energy from each source output and generating a respective return pulse output from defect reflected energy;

peak detecting said respective return pulse outputs throughout a frame duration and generating a flaw pulse output when the detected return pulse output exceeds a predetermined value;

averaging said flaw pulse outputs over a pre-set number of frame durations to provide qualified return pulse outputs; and

providing an output indication of said flaw average pulse output relative to the position along the length of said tubular goods.

4,541,065

DIRECT VOLTS CALIBRATOR

Neil P. Faulkner, and Walter W. Prue, Jr., both of Seattle, Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Sep. 14, 1982, Ser. No. 418,161
Int. Cl.³ G01C *25/00*
U.S. Cl. 364—571 **10 Claims**

1. A direct volts calibrator comprising:

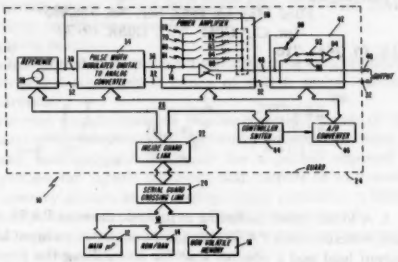
a precision reference source having fixed reference and zero reference potentials;

a digital to analog converter connected to said source and having a controllable conversion characteristic;

power amplifier means connected to an output of said digital to analog converter;

zero amplifier means;

processor means including means for selectively connecting an input of said zero amplifier means to said zero reference potential and determining a first zero output of said zero amplifier means, means for setting said digital to analog converter to cause the power amplifier to have nominally a zero output and for connecting said input of said zero amplifier means to the output of said power amplifier means to cause the zero amplifier means to develop a



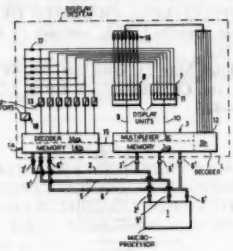
second zero output, and means for determining the difference between the first and second zero outputs of said zero amplifier means to develop an offset correction signal.

4,541,066

METHOD AND APPARATUS FOR CHECKING THE FUNCTIONS OF A DISPLAY SYSTEM

Reiner Lewandowski, Friedberg-Wulfertshausen, Fed. Rep. of Germany, assignor to Pfister GmbH, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,733
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1980, 3043723
Int. Cl.³ G05B *19/02*; G09G *3/00*
U.S. Cl. 364—580 **15 Claims**



1. A method for verifying the correct display of data transmitted from a data processor to a display unit comprising the steps of:

receiving, by the display unit, a data word consisting of a predetermined number of digits coded in a processor code;

storing the individual digits of the processor code;

converting the stored individual digits of the data word from the processor code into a display code;

selectively energizing display elements for each individual digit in accordance with the display code;

determining the display elements selectively energized in order to recover the individual digits in the display code;

converting the individual digits from the display code into the processor code; and

storing the digits in the processor code and retransmitting the digits to the processor for checking the retransmitted digits with the digits transmitted to the display unit.

4,541,067
COMBINATIONAL LOGIC STRUCTURE USING PASS TRANSISTORS

Sterling R. Whitaker, Chubbuck, Id., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed May 10, 1982, Ser. No. 376,895
Int. Cl.[3] G06F *7/52;* G03K *19/20*
U.S. Cl. 364—716 **9 Claims**

1. A logic circuit including as its basic element PASS transistors, wherein each PASS transistor comprises an input lead, an output lead and a control lead for controlling the passing of signals from said input lead to said output lead, said logic circuit comprising:

an output node connected to said output leads;

at least two PASS transistors;

means for supplying a first input function to said input lead of one of said transistors;

means for supplying a second input function to said input lead of another of said transistors; and

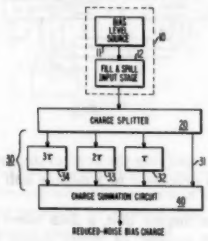
means for supplying selected control signals to said control leads of said transistors, to generate on said output node a selected output function related to said first and/or second input functions;

wherein said first input function is the reference voltage V_{SS}, said second input function is B, one of said selected control signals is $\overline{A}$, another of said selected control signals is A, and said structure thereby represents an AND function.

4,541,068
REDUCING NOISE IN INTRODUCING BIAS CHARGE INTO CHARGE TRANSFER DEVICES

John R. Tower, Deptford, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 23, 1983, Ser. No. 497,403
Int. Cl.[3] G06G *7/16;* H03K *5/159*
U.S. Cl. 364—825 **14 Claims**



1. Apparatus for generating reduced-noise bias charge packets for introduction into an input of a charge transfer device, which apparatus comprises:

means for establishing a bias voltage level;

a fill-and-spill input stage for periodically supplying, from its output, bias charge packets of a size responsive to bias voltage level applied to its input;

a plurality, n in number, of charge transfer channels consecutively ordinally numbered first through nth, each charge transfer channel providing a delay between its input and output equal to the periodicity of successive fill-and-spill cycles multiplied by one less than the cardinal number corresponding to the ordinal numbering of that charge transfer channel;

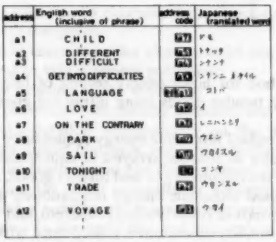
a charge splitter for equally apportioning charge packets received at its input from the output of said fill-and-spill input stage for application from respective outputs thereof to each of the inputs of said charge transfer channels; and

means for summing the charge packets that appear parallel in time at the outputs of said charge transfer channels, to generate said reduced-noise bias charge packets.

4,541,069
STORING ADDRESS CODES WITH WORDS FOR ALPHABETICAL ACCESSING IN AN ELECTRONIC TRANSLATOR

Ikuo Kanou, Yamatokoriyama; Shigenobu Yanagiuchi, Tenri, and Takuro Omori, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1980, Ser. No. 186,322
Claims priority, application Japan, Sep. 13, 1979, 54-118148
Int. Cl.[3] G06F *15/38, 13/00*
U.S. Cl. 364—900 **8 Claims**



1. An electronic translator device wherein a first word in a first language is entered to obtain an equivalent second word in a second language or a second word in said second language is entered to obtain an equivalent first word in said first language, comprising:

input means for entering a first word in the first language;

memory means for storing a plurality of pairs of words, each pair comprising a word in the first language and a corresponding second word in the second language, said memory means also storing an address code associated with each second word, said pairs being arranged in said memory means such that said words in the first language are in alphabetical order, said address code associated with each second word denoting the address of the next second word in the alphabetical sequence of said second words;

means responsive to entry of a first word for addressing one or more locations in said memory means and for retrieving therefrom said entered first word in the first language and its corresponding second word in the second language; and

display means responsive to retrieval of said first word in the first language for displaying the second word corresponding to said entered first word;

said input means further comprising means for entering a second word in said second language;

said device further comprising means responsive to entry of said second word and responsive to said address codes for addressing said second words in said memory means in alphabetical order and for retrieving therefrom said entered second word in the second language;

said display means being further responsive to retrieval of said second word in the second language for displaying the first word corresponding to the entered second word.

4,541,070

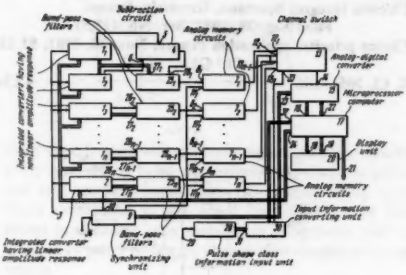
PULSE CHARACTERISTIC METER

Rafail M. Musin, studenchesky gorodok, GSKHI, 15, kv. 13; Mikhail I. Gryaznov, ulitsa Omskaya, 12, kv. 26; Dmitry A. Timofeev, pereulok Tkacheva, 4, kv. 3; Nikolai Y. Filatov, ulitsa Vologdina 1-a, kv. 17, and Tamara S. Andreeva, ulitsa Sverdlova 93, kv. 71, all of Gorky, U.S.S.R.

Filed Nov. 4, 1982, Ser. No. 439,118

Int. Cl.³ G06F *03/00*; G01R *19/00*

U.S. Cl. 364—900 **7 Claims**



1. A pulse characteristic meter capable of measuring and converting (into digital code) of time-amplitude and energy characteristics, and shape coefficients of low-level (2 to 5 mV) pulses in the pico-, nano- and microsecond ranges over a wide spectrum of varying amplitudes, lengths, shapes and rates, including single pulses, comprising:

n integrated pulse converters having nonlinear amplitude response and one integrated pulse converter having linear amplitude response, both said converters performing such conversion of input pulses as to make the amplitude of widened pulses the linear function of their length and, respectively, the linear and nonlinear function of the amplitude of input pulses; inputs, first, second and third outputs of said converters;

a system of processing of said converted pulses;

said inputs of said integrated converters, which are joined and form the input of said pulse characteristic meter;

said outputs of said converters, connected to said converted pulse processing system;

said converted pulse processing system comprising:

a pulse subtraction circuit constituting a complex converter having amplitude characteristic described by a quadratic function;

a first and second inputs, an output of said pulse subtraction circuit;

said first and second inputs of said pulse subtraction circuit, connected to said first outputs of two first integrated converters of said n integrated pulse converters;

n analog memory circuits intended to perform linear conversion of a pulsed signal into a contant voltage during the short control pulse and to store the converted signal for some time; a first input, a second input, an output of each said n analog memory circuits;

said first input of the first analog memory circuit of said n analog memory circuits, electrically connected to said output of said subtraction circuit;

said first inputs of n-1 analog memory circuits from said n analog memory circuits, electrically connected to said first outputs of n-2 integrated pulse converters from said n integrated pulse converters and to said first output of said integrated pulse converter having linear amplitude response;

an analog-digital converter intended to convert the analog information into the binary code; inputs; and input-output, an output of said analog-digital converter;

a synchronizing unit intended to generate short control pulses to operate said analog memory circuits, starting pulses and repeated starting pulses of said analog-digital converter, termination pulses of said analog-digital converter; a first input, a second input, outputs of said synchronizing unit;

a first said input of said synchronizing unit, connected to said second output of said integrated pulse converter having linear amplitude response;

said first output

the first of said outputs of said synchronizing unit, connected to said second joined inputs of said n analog memory circuits;

a channel switch intended to connect said outputs of said analog memory circuits alternately to said first input of said analog-digital converter for a period required to process the signals fed from said outputs of said analog memory circuits in said analog-digital converter; n inputs, a separate input, an output of said channel switch;

said outputs of said n analog memory circuits, connected to said n inputs of said channel switch;

said output of said channel switch, connected to said input of said analog-digital converter;

a common channel;

data buses;

a display unit;

a microprocessor computer intended to perform logical and mathematical operations, data conversion into the binary-decimal code, and delivery of information to said common channel; a first output, a second output, a third output; a first input, a second input, a third input, an input-output of said microprocessor computer;

said first and second outputs of said microprocessor computer, connected via said data buses to said dislay unit;

said third output of said microprocessor computer, connected by one of said data buses to said common channel;

said input-output of said microprocessor computer, connected by one of said data buses to said output-input of said analog-digital converter;

said second input of said analog-digital converter, connected by one data bus of said data buses to said second output of said synchronizing unit;

said second input of said microprocessor computer, connected by one data bus of said data buses to said third outputs of said integrated pulse converters; logical "0" or logical "1" signals are fed through said data bus to indicate dimensions of measurands depending on the amplitude band and duration of pulses.

4,541,071

DYNAMIC GATE ARRAY WHEREBY AN ASSEMBLY OF GATES IS SIMULATED BY LOGIC OPERATIONS ON VARIABLES SELECTED ACCORDING TO THE GATES

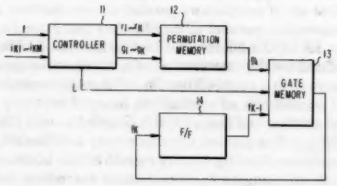
Kenji Ohmori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 514,900

Claims priority, application Japan, Jul. 16, 1982, 57-123870

Int. Cl.³ G06F *7/04, 13/00*

U.S. Cl. 364—900 **3 Claims**



1. A dynamic gate array for simulating an overall operation carried out by a combination of logic groups on a primitive signal to provide a derived signal, said logic groups being

responsive to input signals for providing output signals, respectively, and being operable in steps in response to said primitive signal given as a particular one of said input signals to eventually provide a specific one of said output signals as said derived signal, said dynamic gate array comprising:

register means for storing a plurality of logic signals assigned to said steps;

decode memory means for memorizing a plurality of decoding patterns assigned to said steps, each decoding pattern defining a set of dependent variables for a set of independent variables, the dependent variable sets being decided by said logic groups for the independent variable sets which said input signals are representative of;

gate memory means for memorizing a plurality of logic operations assigned to said steps; and

step specifying means for successively specifying said steps for said logic signals, said decoding patterns, and said logic operations to specify, when each step is specified, at least one of said logic signals, at least two of said decoding patterns, and at least one of said logic operations, said at least one logic signal collectively serving as one of said input signals, said step specifying means thereby providing those at least two of said dependent variable sets which are defined by said at least two decoding patterns for those at least two of said dependent variable sets which the last-mentioned one input signal is representative of, subjecting said at least two dependent variable sets to said at least one logic operation to provide one of said output signals, and storing the last-mentioned one output signal in said register means as at least one of said logic signals that is assigned to the step being specified.

4,541,072

MAGNETIC BUBBLE DISPLAY DEVICE

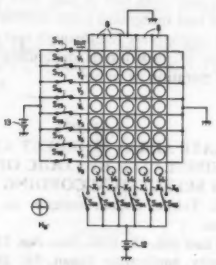
Yoshiki Kikuchi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1982, Ser. No. 337,552

Claims priority, application Japan, Jan. 12, 1981, 56-2120

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—29 **9 Claims**



1. A magnetic bubble display device, comprising: a magnetic film; means for applying a bias magnetic field to said magnetic film; a first set of conductors parallel to one another; a second set of conductors parallel to one another and extending across said first set of conductors to form a matrix of bubble areas each defined by the intersection of a consecutive pair of first conductors with a consecutive pair of second conductors, said first and second sets of conductors being electrically isolated from one another and magnetically coupled to said film; means for applying a first current simultaneously to a plurality of said first conductors flowing in only one direction across said film to cut off an elongate bubble domain extending between a consecutive pair of said second conductors, to thereby form a plurality of magnetic bubbles each confined to a respective bubble area; and control means for thereafter selectively applying said first current to a first conductor and for simultaneously applying a second current to a second conductor, said first and second currents each flowing in only first and second respective directions across said magnetic film to generate first and second magnetic fields, respectively, combining with said bias field to erase a selected one of said plurality of magnetic bubbles.

4,541,073

NON-VOLATILE FLIP-FLOP WITH A STATIC RESETTING

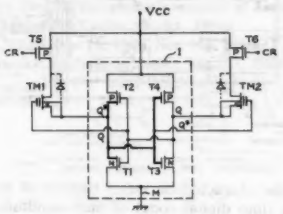
Jean-Michel Brice, and Patrick Maillart, both of Grenoble, France, assignors to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux, Grenoble, France

Filed Sep. 28, 1982, Ser. No. 425,511

Claims priority, application France, Nov. 20, 1981, 81 21801

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—156 **4 Claims**



1. A non-volatile storage device comprising:

a MOS flip-flop circuit having complementary first and second outputs, a reference terminal and a supply terminal;

first and second storage branches each comprising a series circuit of a non-volatile storage element and a switching element, said non-volatile storage element comprising a MOS transistor having an electrically programmable threshold voltage;

the storage element of said first storage branch connected at one end of said first storage branch to said first output of said flip-flop circuit and having a control electrode connected to said second output of said flip-flop circuit;

the storage element of said second storage branch connected at one end of said second storage branch to said second output of said flip-flop circuit and having a control terminal connected to said first output of said flip-flop circuit; and,

said switching elements of said storage branches being connected to said supply terminal at an other end of each said storage branches and having a control electrode for controlling conduction or blocking thereof.

4,541,074

SEMICONDUCTOR DEVICE FOR MEMORY CELL

Motoo Nakano, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1982, Ser. No. 393,118

Claims priority, application Japan, Jun. 30, 1981, 56-102902

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—178 **8 Claims**

4. A semiconductor device read-only memory cell having a bit line and a word line, comprising:

a substrate of a first conductivity type;

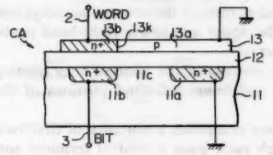
a source region of a second conductivity type opposite that of the first conductivity type, formed in said substrate and operatively connected to ground;

a drain region of the second conductivity type, formed in said substrate and operatively connected to the bit line;

a channel region formed in said substrate between said source and drain regions;

a gate oxide layer formed on said substrate, said drain and channel regions; and

a polycrystalline silicon layer having a PN junction formed therein and formed on said gate oxide layer, having a region of the first conductivity type formed on said channel and source regions, and a region of the second conductivity type formed on said drain region, said first conductivity type region being operatively connected to ground and said second conductivity type region being operatively connected to the word line, information being stored in said read-only memory in accordance with the location of said PN junction in said first conductivity type region.

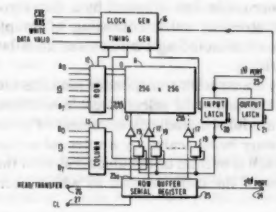


4,541,075

RANDOM ACCESS MEMORY HAVING A SECOND INPUT/OUTPUT PORT

Frederick H. Dill, South Salem; Daniel T. Ling, Croton-on-Hudson, and Richard E. Matick, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,996
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—189 **9 Claims**



1. In a memory for storing a plurality of digital words, each of said words arranged in a row, like digits of said words forming columns, means for addressing each row of said words, and a sense amplifier for each column of digits, the improvement comprising:

a row buffer shift register having parallel inputs connected to said sense amplifiers,

an output port connected only to said row buffer shift register output port,

a data transfer port connected to said shift register for enabling said shift register to read and store data provided by said sense amplifiers, and

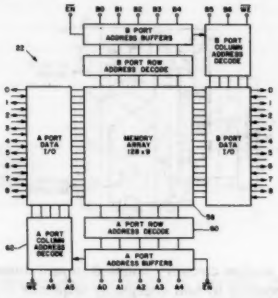
a clock input port connected to said shift register for serially gating each data bit stored in said register to said output port.

4,541,076

DUAL PORT CMOS RANDOM ACCESS MEMORY

Stephen G. Bowers; Tim B. Trueblood, both of Boulder, and Anthony Cabiedes, Louisville, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed May 13, 1982, Ser. No. 377,847
Int. Cl.³ G11C *7/00, 11/40*
U.S. Cl. 365—190 **1 Claim**


B PORT ADDRESS BUFFERS
B PORT ROW ADDRESS DECODE
B PORT COLUMN ADDRESS DECODE
A PORT DATA I/O
MEMORY ARRAY
B PORT DATA I/O
A PORT COLUMN ADDRESS DECODE
A PORT ROW ADDRESS DECODE
A PORT ADDRESS BUFFERS

1. A dual port CMOS random access memory comprising:

a memory array comprising a plurality of memory cell columns, each column being comprised of a plurality of memory cells;

two independent data ports coupled to each memory cell, each data port including a pair of data-in lines and a data-out line through which data may independently be written into or read from an address memory cell at a desired data rate;

two independent address means for respectively directing data through said data ports to or from a desired memory cell in response to address signals;

each memory cell column including two pairs of differential bit lines, one pair of bit lines being selectively coupled to said pair of data-in lines of one port, said coupling being realized with a first set of CMOS transfer gates responsive to said address means, the other pair of bit lines being selectively coupled to said pair of data-in lines of the other port, said coupling being realized with a second set of CMOS transfer gates responsive to said address means, each memory cell of said column being selectively coupled to said pairs of bit lines; and

each memory cell column further including two sense amplifiers, each one of which is coupled to the pair of bit lines associated with one of said dual ports, said coupling occurring at a point between said first and second sets of CMOS transfer gates, the output of said sense amplifier being coupled to the data-out line of its respective port;

whereby two different memory cells may be accessed simultaneously at the same or at different data rates.

4,541,077

SELF COMPENSATING ROM CIRCUIT

A. Karl Rapp, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 12, 1982, Ser. No. 440,921
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—210 **10 Claims**

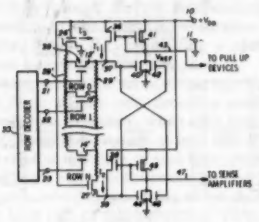
1. In an MOS ROM integrated circuit memory chip having a memory section in which a plurality of transistors are located in an array of columns and rows, each of said columns including a pair of flanking diffused column lines and each of said rows including a metal transistor gate line, wherein said memory section includes an active transistor where a digital one is to be read out and an inactive or absent transistor where a digital zero is to be read out, and a peripheral section in which

the circuits necessary to address and read said memory section are contained, the improvement comprising:

a dummy column created from a representative one of said columns;

an active transistor located at each memory location is said dummy column;

means for selectively energizing each transistor in said dummy column in a sequence that is the same as that employed in the rows in said memory section;



peripheral section circuitry coupled to said dummy column and responsive to said energizing sequence to generate a correction response signal related to the performance of said dummy column; and

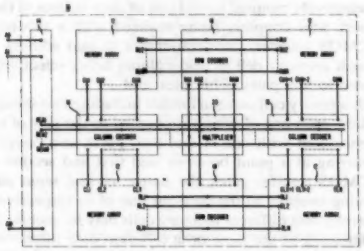
means for coupling said correction response signal to that portion of said peripheral section circuitry associated with said memory section columns whereby said memory section columns are compensated by said dummy column.

4,541,078

MEMORY USING MULTIPLEXED ROW AND COLUMN ADDRESS LINES

Austin C. Dumbri, Easton, and Frank J. Procyk, Center Valley, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 22, 1982, Ser. No. 452,155
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—230 **11 Claims**



11. A memory array of rows and columns of memory cells with row decoders coupled to the rows and column decoders coupled to the columns comprising:

address lines coupled to the column decoders;

a multiplexer coupled to the address lines and to the row decoders for selectively coupling the address lines to the row decoders;

portions of the address lines which are coupled to the multiplexer also being coupled to the column decoders;

the memory array comprises an upper section and a lower section;

the row decoders have an upper portion and a lower portion;

the upper section of the memory array being separated essentially at the center into left and right-hand portions by the upper portion of the row decoders;

the lower section of the memory array being separated essentially at the center into left and right-hand portions by the lower portion of the row decoders;

the column decoders having left and right-hand portions;

the left-hand portion of the column decoders being located between the upper and lower left-hand portions of the memory array;

the right-hand portion of the column decoders being located between the upper and lower right-hand portions of the memory array;

the common portion of the address lines running between the upper and lower left-hand portions of the memory array;

the multiplexer comprises a plurality of first switching devices which each have a control terminal and first and second output terminals;

the control terminals of the switching devices all being coupled together to means for turning on or turning off all of the switching devices; and

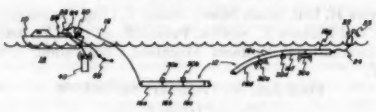
the first output terminal of each switching device being coupled to a separate one of the address lines and the second output terminal of each switching device being coupled through a separate row address line to a separate one of input terminals of the row decoders.

4,541,079

MARINE STREAMER CABLE RECOVERY SYSTEM

Ben B. Thigpen, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Jan. 27, 1983, Ser. No. 461,399
Int. Cl.³ G01V *1/38*; H01B *7/12*
U.S. Cl. 367—19 **2 Claims**



1. A system for recovering a severed portion of a seismic marine streamer cable that is towed by a ship through a body of water, the streamer cable consisting of coupled-together cable sections, each including a carcass and an inflatable plastic jacket, comprising:

acoustically-transparent transponder modules secured externally to the jacket of selected cable sections, said transponder modules including a container of pressurized gas, the container being sealed by a solenoid-actuated exhaust valve which is in fluid communication with the interior of the jacket of the cable section to which each module is secured;

an acoustic transponder mounted in each said module, operatively connected with the solenoid-actuated exhaust valve;

a signaling device associated with the towing ship for emitting an encoded acoustic alarm signal for reception by said transponder modules so that in response to the encoded acoustic alarm signal, the transponder triggers the solenoid-actuated exhaust valve to open, thereby inflating the jacket of each cable section to which a transponder module is secured.

means, associated with said transponder, for transmitting an encoded acoustic answerback signal in response to reception of said encoded acoutic alarm signal from said signalling device.

means associated with said signalling device, for receiving said encoded acoustic answerback signals and determining therefrom the distance and direction of the severed por-

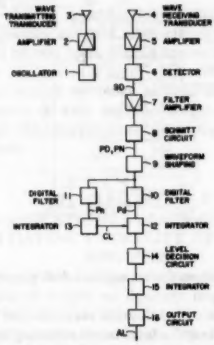
tion of the seismic streamer cable, with respect to the towing ship.

4,541,080

ULTRASONIC ALARM DEVICE

Makoto Kodaira, Tokyo, Japan, assignor to Uro Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1981, Ser. No. 316,676
Int. Cl.³ G08B *13/16*
U.S. Cl. 367—94 **9 Claims**



1. An ultrasonic alarm device in which an ultrasonic wave is transmitted to a watching area, and the ultrasonic wave reflected is detected by a detector to obtain a Doppler signal in a predetermined frequency band due to motion of a person, thereby to form an alarm output; which comprises:

(a) a Schmitt circuit which receives a detection output of said detector and which provides an output at a logic level "1" when said detection output exceeds a predetermined Schmitt level, and provides an output at a logic level "0" when said detection output does not exceed said predetermined Schmitt level, thus converting said detection output into pulses;

(b) a waveform shaping circuit responsive to leading edges of the pulses output by said Schmitt circuit for shaping a pulse output of said Schmitt circuit into a pulse train having pulses of constant narrow pulse width, whereby frequency discrimination of the Schmitt circuit outputs is possible, and

(c) a digital band pass filter for transmitting, of a pulse output of said waveform shaping circuit, a pulse train having a frequency included in the frequency band of said Doppler signal,

(d) means for integrating the output of said digital filter, and

(e) means for producing an alarm output when the output of said integrating means is above a predetermined level for a predetermined time.

4,541,081

ELECTROACOUSTIC TRANSDUCER

John R. E. Smith, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 25, 1982, Ser. No. 352,271
Int. Cl.³ G01V *1/40, 1/16*
U.S. Cl. 367—168 **7 Claims**

7. Apparatus for acoustic well logging, comprising:

at least one electroacoustic transducer for transmitting acoustic energy;

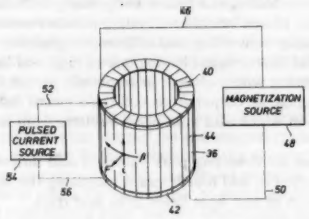
said transmitting transducer having a plurality of cylindrical body members coaxially arranged, said cylindrical body members bonded together and electrical insulated from one another along the cylinder surfaces thereof;

said transmitting transducer having a toroidal winding thereabout and means for passing d.c. current through said winding for

establishing circumferential magnetic vectors thereabout;

said transmitting transducer having means connected to the axial ends of said body members for passing longitudinal impulse current flow through said body members thereby causing a radially emitted energy; and

at least one electroacoustic transducer disposed longitudinally from said at least one transmitting transducer for receiving said transmitted acoustic energy;



said receiving transducer having a plurality of cylindrical body members coaxially arranged, said cylindrical body members bonded together and electrically insulated from one another along the cylinder surface thereof;

said receiving transducer having a toroidal winding thereabout and means for passing d.c. current through said winding for establishing circumferential magnetic vectors thereabout;

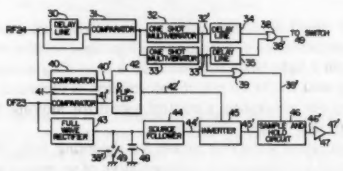
said receiving transducer having means connected to the axial ends of said body members for detecting longitudinal impulse current flow through said body members caused by radially impinging energy.

4,541,082

DEVICE FOR OPTICALLY TRACKING INFORMATION

Tatsuo Horikoshi, Toyokawa; Seiji Yonezawa, Hachioji; Toshiaki Tsuyoshi, Kokubunji; Hiroshi Tooyama, Hachioji, and Masatoshi Otake, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 19, 1982, Ser. No. 443,033
Claims priority, application Japan, Nov. 25, 1981, 56-187871
Int. Cl.³ G11B *7/12, 21/10*
U.S. Cl. 369—44 **10 Claims**



1. A device for optically tracking information suitable for use in an information reproducing device including a laser light source, a rotating recording medium in which predetermined information is recorded in the form of a track so that said information can be optically reproduced, an optical system disposed between said laser light source and said rotating recording medium for irradiating said track with a light beam from said laser light source, and a photodetector for sensing diffracted waves from information pits on said track, to reproduce said information by an electric signal from said photodetector, said device for optically tracking information comprising:

first means for detecting a first summation signal indicating the sum of output signals from four parts of said photodetector,

said photodetector being disposed on the optical axis of said optical system, a fictitious X-Y coordinate system at said photodetector having the origin thereof on said optical axis, an X-axis of said coordinate system being made parallel to the direction of said track, a Y-axis of said coordinate system being made perpendicular to the direction of said track, each of said four parts of said photodetector being disposed one by one in four quadrants of said coordinate system;

second means for detecting a difference signal between second summation signals, each of said second summation signals indicating the sum of output signals from a pair of parts of said photodetector, said pair of parts facing each other with said origin of said coordinate system therebetween;

third means for converting said difference signal into a binary signal, said binary signal having one of high and low levels in accordance with a change in amplitude of said first summation signal, an output from said third means indicating a direction in which said light beam deviates from said track; and

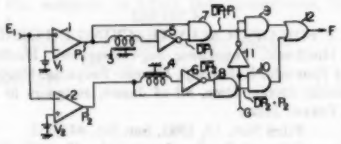
fourth means for detecting peak values of said difference signal, an output of said fourth means indicating the magnitude of deviation of said light beam from said track.

4,541,083

FOR JUMPING A LIGHT SPOT ON A TRACK OF A RECORDING MEDIUM

Takeshi Maeda; Motoo Uno, both of Kikubunji, and Masahiro Takasago, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1982, Ser. No. 446,251
Claims priority, application Japan, Dec. 4, 1981, 56-194518
Int. Cl.³ G11B *21/10*
U.S. Cl. 369—44 **14 Claims**



1. A device for generating a light spot control signal for jumping a light spot on a track of a recording medium comprising:

error signal detecting means for generating an error signal representative of positions of a light spot relative to tracks, from a light beam irradiated on a recording medium having said tracks on which information is recorded;

means for generating a control signal for moving the light spot in a desired direction;

timing signal detecting means for detecting from the error signal a timing signal representative of an instant at which the light spot is present at the middle point between adjacent tracks, said timing signal detecting means including first means for providing, from the error signal, first pulse outputs in opposite phases which change at zero points of said error signal, second means for providing second pulse outputs representative of times when each of the first pulse outputs rise, and third means for selecting one of the second pulse outputs in accordance with the desired direction and delivering the selected pulse output as the timing signal; and

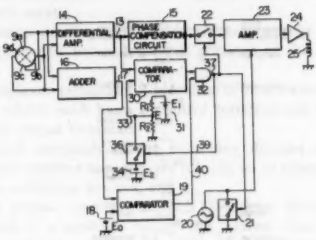
means for controlling the polarity of said control signal in response to said timing signal, whereby said control signal jumps the light spot from a track being scanned thereby to an adjacent track.

4,541,084

FOCUS SERVO SYSTEM HAVING OBJECT LENS PROTECTION CIRCUIT FOR AN OPTICAL DISC PLAYER

Masuo Oku, Kamakura; Masami Yamashita, Yokohama; Yoshio Miura, Yokohama, and Motoyuki Suzuki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 474,031
Claims priority, application Japan, Mar. 10, 1982, 57-36382
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—45 **5 Claims**



1. A focal servo system for an optical disc player wherein a laser beam is impinged through an object lens onto a disc having information recorded thereon such that the information is optically detected, and the laser beam reflected by the disc is sensed by a photosensor to reproduce the recorded information from the disc, comprising:

two pairs of photo-cells interconnected in each pair and arranged in a circle at an angle of 90 degrees from each other for receiving the laser beam reflected by said disc;

a differential amplifier connected to said two pairs of photo-cells for producing a differential signal of the output signals of said two pairs of photo-cells;

an adder connected to said two pairs of photo-cells for producing a sum signal of the output signals of said two pairs of photo-cells;

a phase compensation circuit connected to said differential amplifier for phase-compensating said differential signal of said differential amplifier; p1 a first comparator connected to said adder to receive said sum signal of said adder for comparing said sum signal with a predetermined first reference voltage and producing an output signal of a first state until said sum signal reaches said first reference voltage and producing an output signal of a second state when said sum signal is above said first reference voltage;

an actuator disposed in a vicinity of said object lens for driving said object lens toward or away from said disc;

a signal generator for generating a sweep signal to drive said object lens toward said disc;

an amplifier electrically connected to said actuator and connected to said phase compensation circuit and said signal generator for supplying the phase-compensated differential signal supplied from said phase compensation circuit, to said actuator and supplying said sweep signal supplied form said signal generator, to said actuator;

switches connected to said first comparator and actuated by the output signal of said first comparator for supplying said sweep signal from said signal generator to said amplifier when the output signal of said first comparator is in said first state and supplying said differential signal from said phase compensation circuit to said amplifier when the output signal of said first comparator is in said second state;

a second comparator connected to said differential amplifier to receive said differential signal from said differential amplifier for comparing said differential signal with a second predetermined reference voltage and producing an output signal of a third state until said reference voltage

reaches said second reference voltage and producing an output signal of a fourth state when said differential signal is above said second reference voltage;

a logic circuit receiving the output signal of said first comparator and the output signal of said second comparator for maintaining the output signal of said first comparator supplied from said first comparator to said switches at said first state when said second comparator supplies the output signal of said third state and supplying the output signal of said first comparator to said switches when said second comparator supplies the output signal of said fourth state; and

a reference voltage selection switch connected to said second comparator and said logic circuit to receive the output signal of said logic circuit for switching said second reference voltage to a third reference voltage different from said second reference voltage and maintaining the output signal of said second comparator at said fourth state when the output signal of said logic circuit is at said second state.

4,541,085

SIMPLE ACOUSTIC PLAYBACK DEVICE FOR A RECORD HAVING PLURALITY OF RECORDING GROOVES

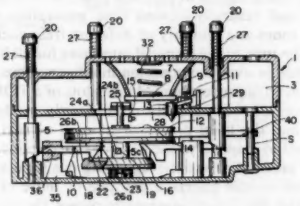
Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 619,550

Claims priority, application Japan, Sep. 30, 1983, 58-182335

Int. Cl.³ G11B *3/20, 31/00;* **A63H** *3/33*

U.S. Cl. 369—65 **1 Claim**



1. An acoustic playback device including;

a casing;

a record disc having a recording surface with a plurality of recording grooves, the record disc being rotationally supported within the casing;

a sound transmitting plate;

a speaker cone;

a speaker unit stationarily mounted above the record disc and containing the sound transmitting plate and the speaker cone;

a pickup located between the sound transmitting plate and recording disc unit;

a stylus-pressure spring exerting pressure on the pickup;

a reset spring biasing the pickup toward a playback start position on the record disc and away from the recording surface of the record disc;

a motor;

a playback finish switch for disconnecting power to the motor when the pickup is moved to the playback start position;

stylus-pressure releasing bars for removing the record disc from contact with the pickup;

a stopper pin projecting radially outward from the record disc;

a plurality of selector levers corresponding to the number of recording grooves, the selector levers contacting the stylus-pressure releasing bars to bring the stylus-pressure releasing bar into contact with the stopper pin which stops rotation of the record disc and brings the selected recording groove into a start position;

selector bar biasing means for outwardly and backwardly biasing the selector levers away from the axis of rotation of the record disc wherein the improvement comprises:

a latch plate unitary with the record disc and axially spaced from the reverse side of the record disc, the latch plate having an annular vertical surface facing the record disc and directed to the center of the recording disc;

hooks formed on the stylus-pressure releasing bars engagably contacting the annular vertical surface upon forward motion of the stylus-pressure releasing bars;

stylus-pressure releasing portions located on the ends of the stylus-pressure releasing bars capable of engagably contacting the stopper pin of the record disc when the record disc is moved ahead sychronous with the stylus-pressure releasing bars; and

tapered surfaces formed between the stylus-pressure releasing portion and the stopper pin and adapted to cause a cam action allowing further rotation of the stopper pin after making engagement with the stylus-pressure releasing portion to cause the record disc to move away form the sound transmitting plate thereby disengaging the hook of the stylus-pressure releasing bar from the vertical wall and permitting the stylus-pressure releasing bars to be returned by the force of the springs to their original position;

the tapered surfaces between the stylus-pressure releasing bars and the peripheral edge of the latch plate being taperedly adapted to create a cam action that a forward movement of the stylus-pressure releasing bar against the force of the spring causes the latch plate to rotate together with the disc unit away from the sound transmitting plate.

4,541,086

DISC CLAMPING MECHANISM

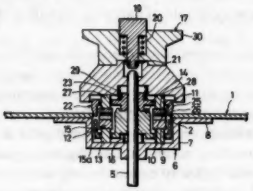
Kenji Tanaka, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 6, 1984, Ser. No. 638,136

Claims priority, application Japan, Aug. 8, 1983, 58-123187[U]; Aug. 8, 1983, 58-123188[U]

Int. Cl.³ G11B *3/00, 3/62, 17/00*

U.S. Cl. 369—271 **13 Claims**



1. A disc mounting mechanism capable of mounting first and second discs having different center hole diameters to a rotated shaft, the diameter of the center hole of said first disc being greater than the diameter of the center hole of said second disc, comprising: first and second turntables mounted concentrically on said rotated shaft for rotation with said rotated shaft, said turntables being concentric with respect to one another with said first turntable surrounding said second turntable; first disc locating means, said first disc locating means having first and second cylindrical portions having outer diameters corresponding to diameters of center holes in said first and second discs, respectively, said first cylindrical portion being located between said first and second turntables and said second cylindrical portion being inside said second turntable, said first disc locating member being slidable axially with respect to said first and second turntables parallel to said rotated shaft; and first and second clamping members for clamping said first and second discs to said first and second turntables, respectively, said first and second clamping members being slidably mount-

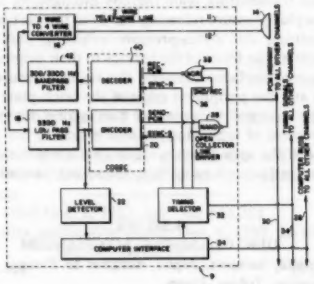
able on said rotated shaft, said first clamping member comprising means for depressing said first disc locating means to move said first cylindrical portion below a surface of said first disc when said first disc is clamped to said first turntable by said first clamping member.

4,541,087

DIGITAL TELECONFERENCING CONTROL DEVICE, SYSTEM AND METHOD

Bluford M. Comstock, Boulder, Colo., assignor to ConferTech International, Inc., Denver, Colo.

Filed Jun. 27, 1983, Ser. No. 508,256
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—62 **29 Claims**



1. A digital teleconferencing control device, comprising:

first connecting means adapted to be connected with telephone means capable of providing signals in analog form;

second connecting means adapted to be connected with highway means capable of carrying signals in digital form; and

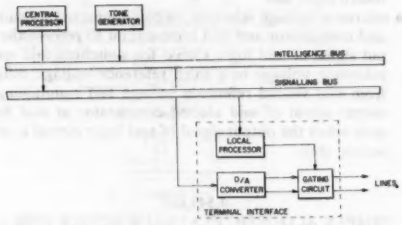
signal processing means connected with said first and second connecting means for receiving analog signals from said first connecting means during a predetermined time period within predetermined time frames, and responsive thereto providing output signals in digital form to said second connecting means unless digital signals are then present on said highway means during said predetermined time period, and for receiving, during preselected time periods within said predetermined time frames with one of said preselected time periods occurring timewise simultaneously with said predetermined time period, a plurality of digital signals from said second connecting means, when such digital signals are present on said highway means during said preselected time periods, for combining said signals at said signal processing means except that digital signals provided to said highway means originating from said first connecting means are precluded from being received and combined with other digital signals at said signals processing means, and responsive thereto providing output signals in analog form indicative of said received digital signals to said first connecting means whereby said control device can be utilized to both place an outgoing digital signal on said highway means and receive incoming digital signals from said highway means during said predetermined time frames to thereby provide apparent simultaneous speaking and listening capabilities at said telephone means.

4,541,088

TONE GENERATION CIRCUIT FOR AUTOMATIC PCM-TDM TELECOMMUNICATION EXCHANGE

Gary A. Sarson, Ottawa, Canada, assignor to Standard Telephones and Cables, PLC, London, England

Filed Oct. 6, 1983, Ser. No. 539,410
Claims priority, application United Kingdom, Oct. 8, 1982, 8228845
Int. Cl.³ H04J *3/12*; H04Q *11/04*
U.S. Cl. 370—110.2 **8 Claims**



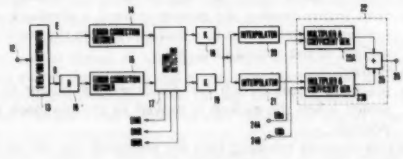
1. An automatic telephone exchange, comprising a plurality of terminal interfaces serving subscriber and trunk lines, each interface being connected to a common intelligence bus on which speech and other intelligence is conveyed in TDM manner using PCM and to a common signalling bus, and each interface having a local processor connected to the signalling bus; a central processor connected to the signalling bus for supplying control signals to the local processors of the terminal interfaces; and centrally-located tone generation means for generating tones at a plurality of different frequencies and for supplying the tone to the terminal interfaces for all lines served by the exchange over the common intelligence bus, the tones being conveyed in predetermined time slots of a TDM cycle so as to be available substantially continuously at the terminal interfaces, and the local processor of each of said interfaces being formed to respond to the control signals conveyed from the central processor over the signalling bus so as to apply to a line served by that interface any one or more of the tones needed by that line for supervisory purposes, the local processor controlling in response to the control signals both the selection of a tone or tones to be used and the cadences, if any, with which the selected tone or tones are applied to the line.

4,541,089

APPARATUS FOR CONNECTING DIGITAL DATA

Nobuhiko Watanabe, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 16, 1983, Ser. No. 466,908
Claims priority, application Japan, Feb. 17, 1982, 57-23796
Int. Cl.³ G11B *27/02, 5/00*
U.S. Cl. 371—8 **20 Claims**



1. In an apparatus for reproducing from a record medium a composite digital data signal that was formed by connecting first and second digital data signals, in which said first and second signals are interleave-coded so that the signals overlap before and after a connecting point between the respective signals, thereby forming the composite digital data signal, and

in which said composite digital data signal is muted in the vicinity of said connecting point for limiting errors in the output from the apparatus; the combination of:

detector means receiving said composite digital data signal for detecting a termination point of said muting of said second digital data signal and generating a detection signal upon such detection; and

cross-fading means receiving said composite digital data signal and said detection signal for gradually reducing data values of said first digital data signal and gradually increasing data values of said second digital data signal in response to said detection signal.

4,541,090

SEMICONDUCTOR MEMORY DEVICE

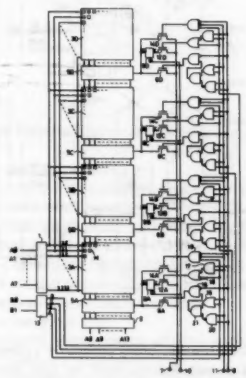
Tsuyoshi Shiragasawa, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadomi, Japan

Filed Jun. 1, 1982, Ser. No. 383,838

Claims priority, application Japan, Jun. 9, 1981, 56-88385; Jun. 16, 1981, 56-93339

Int. Cl.³ G11C *13/00*

U.S. Cl. 371—21 **6 Claims**



1. A semiconductor memory device including a testing arrangement therein and adapted such that parts thereof tested as defective can be disabled, allowing those parts tested non-defective to be used, comprising:

a plural number of memory array blocks having common address signal lines and common input/output lines,

means for inputting predetermined data to predetermined addresses of said blocks:

means for reading data previous input to said blocks as output data;

a comparator associated with each block for said input and output data and providing a pass or fail signal indicative of an identity or non-identity, respectively therebetween and

means for disabling any blocks for which a fail signal was provided by its associated comparator.

4,541,091

CODE ERROR DETECTION AND CORRECTION METHOD AND APPARATUS

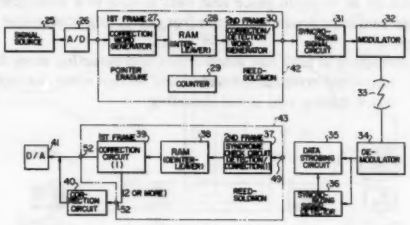
Masami Nishida, Yokohama; Keizo Nishimura, Yokosuka; Takao Arai, and Nobutaka Amada, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,634

Claims priority, application Japan, Jun. 11, 1982, 57-99201; Jun. 11, 1982, 57-99203

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—39 **13 Claims**



1. A method for correcting errors for a code comprising a first error correction block having words each belonging to one of a plurality of channels of PCM data sequence in a first arrangement and a first parity word thereafter, and a second error correction block having words each belonging to one of a plurality of channels of PCM data sequence and said first parity word in a second arrangement and second parity words therefor, said second arrangement of sequence being derived by delaying said first arrangement of data sequence and said first parity word by different time period for each channel, said second error correction block being an error detection and correction code having the ability to correct errors in up to k words (k is an integer) in one block by operating error syndromes and determining error locations based on the error syndromes, said first error correction block having the parity word capable of correcting one error word in one block by operating error syndromes, said method comprising the steps of:

(a) decoding said second error correction block delaying said plurality of channels of PCM data sequence in said first arrangement and said first parity word by a different time period for each channel to reconfigure them into said first arrangement, correcting errors in not more than k words in said second error correction block, and when errors in no less than k words are detected, adding an error pointer to each of the words to regard that all of the words in said block are in error; and

(b) decoding said first error correction block, operating error syndrome based on the words contained in said first error correction block, determining an error pattern based on said error syndromes, and correcting the error only when said first error correction block contains only one word which is in error or regarded as in error and which has been delayed in said second error correction block and has the error pointer added thereto.

4,541,092

METHOD FOR ERROR CORRECTION

Yoichiro Sako, Tokyo, and Kentaro Odaka, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 396,004, Jul. 7, 1982, abandoned. This application May 31, 1984, Ser. No. 615,670

Claims priority, application Japan, Aug. 14, 1981, 56-127595

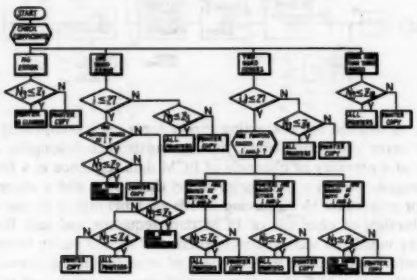
Int. Cl.³ G06F *11/10*

U.S. Cl. 371—39 **13 Claims**

1. An improved method of error correcting words of pulse code modulated data which are encoded in first and second error correcting blocks, said first error correcting block con-

taining said words of data in a plurality of channels forming a first arrangement state and first check words associated therewith and said second error correcting block containing said first arrangement state and first check words, delayed at each channel by different delay times to form a second arrangement state, and second check words associated therewith; and in which said encoded data is decoded by initially decoding said second error correcting block in a first stage, delaying each channel of said second arrangement state by different delay times so as to reform said first error correcting block and subsequently decoding the reformed first error correcting block so as to again place said data in said first arrangement state: said improved method of error correcting comprising the steps of

correcting at least one word errors and detecting more than two word errors contained in said second error correcting block during said initial decoding;



adding indicators of at least first and second kinds which respectively indicate correction of one word errors and detection of errors of more than two words, said indicators being added to at least corresponding erroneous words within said second error correcting block during said initial decoding;

correcting at least one word errors contained in said first error correcting block during said subsequent decoding; and

determining the kinds of said pointers and their respective numbers thereof contained in said first error correcting block during said subsequent decoding so that in accordance with the results of said determination all remaining errors are detected and corrected and erroneous error correction is avoided.

4,541,093

METHOD AND APPARATUS FOR ERROR CORRECTION

Tsuneo Furuya, and Katsuya Hori, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 488,373

Claims priority, application Japan, Apr. 28, 1982, 57-72220; Feb. 18, 1983, 58-25815

Int. Cl.[3] **G06F** *11/10*

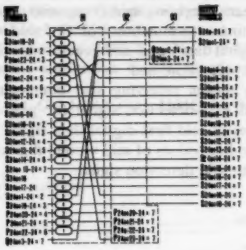
U.S. Cl. 371—40 **18 Claims**

1. A method of processing digital data including main data and subcoding data ancillary thereto; comprising the steps of:

grouping said subcoding data into a plurality of PACKETs, each PACKET comprising a plurality of PACKs, each PACK comprising a plurality of SYMBOLs and each SYMBOL comprising a plurality of bits;

adding a first redundant code for error detection or error correction to each of said PACKs;

interleaving said subcoding data and said first redundant code in accordance with a first format to form interleaved data; and



combining said interleaved data and said main data for transmission.

4,541,094

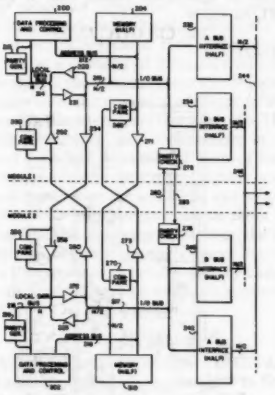
SELF-CHECKING COMPUTER CIRCUITRY

Jack J. Stiffler, Concord; Michael J. Budwey, and James M. Nolan, Jr., both of Holliston, all of Mass., assignors to Sequoia Systems, Inc., Marlboro, Mass.

Filed Mar. 21, 1983, Ser. No. 477,536

Int. Cl.[3] **G06F** *11/16*

U.S. Cl. 371—68 **20 Claims**



7. Circuitry for a fault-tolerant computer system comprising, two identical circuit halves, each of said circuit halves in turn comprising,

a data processing and control unit capable of generating timing, addressing and control signals and generating and receiving data words of width N;

a memory unit capable of storing data words of width less than N, said memory being responsive to said address signals for retrieving or storing data words therein;

first means responsive to said control signals for transferring a portion of width less than N of said data words of width N between said data processing and control unit and said memory;

second means responsive to said control signals for transferring data words of width less than N between said data processing and control unit and the memory in the other circuit half;

interface means for connecting said circuit half to said computer system, said interface means being capable of

handling data words of width less than N and being responsive to said control signals for passing data words of width less than N between said computer system and said first transferring means;

means for comparing address information and data generated by said data processing and control unit with address information and data generated by the data processing and control unit in the other circuit half;

means responsive to data words generated by said data processing and control means for encoding said data words generated by said data processing and control means with an error-detecting code; and

means responsive to incoming information passing through said interface means for checking said error detecting code associated with said incoming information to insure proper reception of said information.

4,541,095

SYSTEM FOR COMMUNICATION BY WAY OF REPEATEDLY TRANSMITTED MESSAGES, AND STATIONS FOR USE IN SUCH A SYSTEM

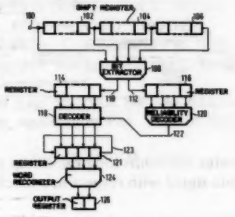
Lodewijk B. Vries, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1983, Ser. No. 465,742

Claims priority, application Netherlands, Feb. 15, 1982, 8200560

Int. Cl.³ G06F *11/08, 11/14*

U.S. Cl. 371—69 **8 Claims**



1. A system for transmitting messages over a message channel comprising:

a transmitting station including:

means for generating a message as a succession of a mutually identical multibit code words which utilizes a small portion of said message channel; said code words including at least one word dedicated to a particular receiving station and having a minimum Hamming-distance of at least two with respect to the remaining code words inclusive of a cyclical transposition of the latter; and

a receiving station including:

(a) separation means connected to said message channel for extracting a message therefrom;

(b) a decoder connected to said separation means for decoding said message, said decoder having a decision means for windowless detection of any word equal in length to at least one of said multibit code words and for indicating at least one code word.

4,541,096

OFF-LINE, RECIRCULATING, WASTE MANAGEMENT SYSTEM FOR CHEMICAL LASERS

Raymond F. Walsh, IV, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 21, 1984, Ser. No. 581,929

Int. Cl.³ H01S *3/22*

U.S. Cl. 372—59 **9 Claims**

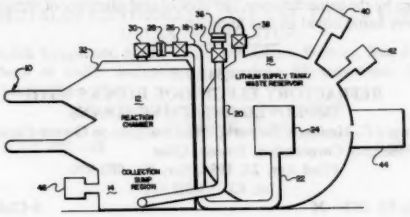
1. A waste management system for removing the exhaust products of a chemical laser, comprising:

a reaction chamber coupled to receive the exhaust products of a chemical laser, said chamber having a collection sump region at its bottom;

a supply tank adapted to be loaded with a chemical which is reactive with said exhaust products to produce one or more solid and/or liquid waste products;

injection means located at the top of said reaction chamber for delivering and distributing an input liquid into the chamber;

valved feed line means coupling said supply tank to said injection means, said feed line means being constructed with a coupling which can be disjoined when desired;



return line means coupling said collection sump area to said supply tank, said return lines means being constructed to be disjoined when desired;

means for pressurizing said chemical in said supply tank whereby, when said valved feed lines are opened, the chemical is fed to the injection means and delivered to the reaction chamber to react with the exhaust products therein to form waste products which collect in said sump region; and

transfer means for transferring, after the supply tank chemcial is used up and said pressurizing means is shut off, said waste products from said sump area to said supply tank.

4,541,097

GAS LASER DEVICE WITH PLURAL ELECTRODE MEMBERS ON THE UPPER GAS FLOW SIDE

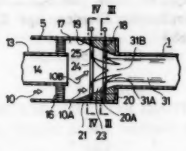
Kouji Kuwabara; Kouji Sasaki; Hiroyuki Sugawara, all of Hitachi; Toshiharu Shirakura, Toukai; Yukio Kawakubo, and Satoshi Takemori, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,223

Claims priority, application Japan, Nov. 27, 1981, 56-189202

Int. Cl.³ H01S *3/06*

U.S. Cl. 372—87 **5 Claims**



1. A gas laser device comprising a discharge tube having an optical axis, a deflection mirror and an output mirror spaced from each other and provided on the optical axis in said discharge tube, a gas feed port and a gas outlet port each provided on said discharge tube between said deflection mirror and said output mirror, means provided with a heat-exchanger for circulating a gas medium from said gas feed port to said gas outlet port through said discharge tube, and at least two electrodes provided in said discharge tube between said gas feed port and said gas outlet so that a glow discharge is formed to cause said gas medium to have an inverted population and threby generate a laser beam, one of said electrodes being on an

upper gas stream side of said discharge tube, the other downstream of said one, characterized in that said electrode on the upper gas stream side comprises an inner electrode member and at least one outer electrode member spaced from and disposed upstream of said inner electrode member, each of said electrode members having a central bore from which glow discharge takes place, said outer electrode member having a plurality of through-bores at portions surrounding said central bore.

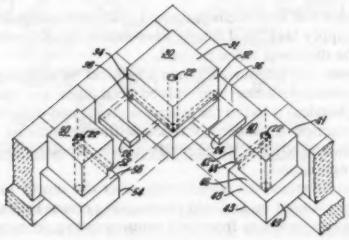
2. The gas laser device as claimed in claim 1, wherein said plurality of through-bores formed in said outer electrode member are arranged equiangularly and spaced from said central bore by the same distance, the area of said plurality of through-bores being equal to one another.

4,541,098

REFRACTORY ELECTRODE BLOCKS WITH IMPROVED RETAINING MEANS

Edward C. Heubach, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 23, 1984, Ser. No. 603,070
Int. Cl.³ C03B 5/27
U.S. Cl. 373—36 **5 Claims**



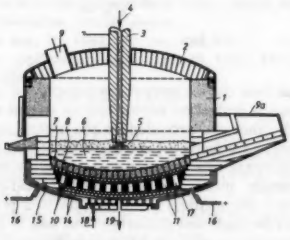
5. A method of retaining electrode blocks against the bottom wall of an electric glass-melting furnace comprising: inserting a key in a groove cut in each of the adjacent vertical walls of at least two of the electrode blocks; and positioning paving blocks on ledges carved into opposite and adjacent walls of the keyed electrode blocks.

4,541,099

DC ARC FURNACE IMPROVED HEARTH CONSTRUCTION

Bo Rappinger, and Sven-Einar Stenkvist, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Apr. 17, 1984, Ser. No. 275,377
Claims priority, application Sweden, Apr. 21, 1983, 8302248; Oct. 17, 1983, 8305683
Int. Cl.³ H05B 7/00
U.S. Cl. 373—72 **6 Claims**



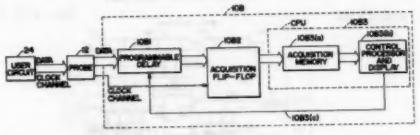
1. A DC arc furnace having an electrically conductive hearth adapted to contain a melt, at least one arcing electrode above the hearth and adapted to form a heating arc with the melt when the hearth and electrode are supplied with DC power; the hearth having a wear lining directly contacted by the melt and formed by refractory material through which electrical conductors extend from the bottom of the wear lining to its top, layers of electrically conductive bricks under the wear lining and having a top layer electrically connecting with the electrical conductors, and a metal plate under the layers of electrically conductive bricks and adapted to be connected with the DC power, the layers of conductive bricks having a bottom layer in electrical connection with the metal plate; wherein the improvement comprises a layer of mixed bricks between the top and bottom layers of the electrically conductive bricks and formed in part by electrically conductive bricks and in part by electrically non-conductive bricks.

4,541,100

APPARATUS INCLUDING A PROGRAMMABLE SET-UP AND HOLD FEATURE

Steven R. Sutton, Beaverton, Oreg.; Michael S. Hagen, Vancouver, Wash.; David D. Chapman, Portland, Oreg.; Glenn S. Gombert, Hillsboro, Oreg., and Steven R. Palmquist, Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 375,506, May 6, 1982, Pat. No. 4,481,647. This application Jul. 19, 1982, Ser. No. 399,938
Int. Cl.³ H04L 1/00
U.S. Cl. 375—10 **4 Claims**



1. An apparatus for controlling the set-up and hold times of an acquired data signal with respect to a clock signal, comprising:

means for entering an actual set-up and hold time associated with said acquired data signal relative to said clock signal;

means for storing a desired set-up and hold time associated with said acquired data signal relative to said clock signal; and

control means responsive to the actual set-up and hold time entered via the means for entering and to the desired set-up and hold time stored in the means for storing for changing the relative timing of the acquired data signal with respect to said clock signal until the set-up and hold times associated with said acquired data signal are changed from the actual value to the desired value.

4,541,101

PROCESS AND DEVICE FOR VOICE INTERPOLATION IN A TRANSMISSION SYSTEM FOR DIGITIZED VOICE

Jean Potage, Franconville, and Philippe Sidin, Paris, both of France, assignors to Thomson CSF, Paris, France

Filed Dec. 27, 1983, Ser. No. 565,715
Claims priority, application France, Dec. 28, 1982, 82 21875
Int. Cl.³ H04B 12/04, 1/10; H04L 27/14, 25/16
U.S. Cl. 375—28 **3 Claims**

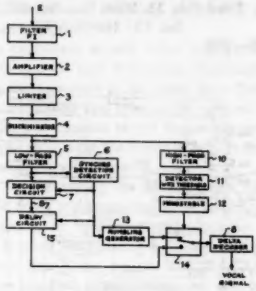
1. A process for voice interpolation in a transmission system of digitized voice data operating in a prefiltered FSK narrow band modulation process, comprising:

providing disturbance corrupted FSK demodulated information corresponding to said digitized voice data;

high-pass filtering said information with a cutoff frequency at least equal to the highest frequency of the prefiltered FSK modulation band in order to provide a disturbance detection signal;

deriving digitized voice data from said information;

generating a predetermined pulse sequence;
decoding a digital signal to produce a restored, disturbance-free voice signal; and

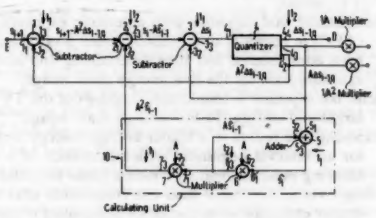


supplying selectively said digitized voice data or said predetermined pulse sequence as said digital signal such that the presence of said disturbance detection signal causes said pulse sequence to be substituted for said digitized voice data.

4,541,102
HIGH-SPEED DIFFERENCE PULSE CODE MODULATION CODER

Hans-Joachim Grallert, Groebenzell, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 16, 1983, Ser. No. 523,610
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232516
Int. Cl.[3] H04B *12/04*
U.S. Cl. 375—30 **6 Claims**

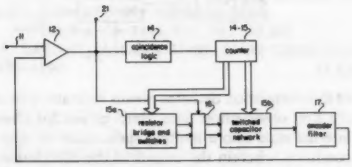


1. A high-speed difference pulse code modulation (DPCM) coder, comprising:
first, second and third subtractors each including an output and first and second inputs, said first input of said first subtractor serving as the input of said coder, for receiving PCM input signals to be coded, said output of said first subtractor connected to said first input of said second subtractor and said output of said second subtractor connected to said first input of said third subtractor;
a quantizer including an input connected to said output of said third subtractor, and at least a first output and a second output, and operable to emit at said first output a first calculation value ($A^2 \cdot \Delta s_{i,q}$) including a quantized DPCM signal value ($\Delta s_{i,q}$) multiplied by the square of a prediction factor (A) and to emit at said second output a second calculation value ($A \cdot \Delta s_{i,q}$) including the quantized DPCM signal value ($\Delta s_{i,q}$) multiplied by the prediction factor (A), said first output of said quantizer connected to said second input of said first subtractor and said second output of said quantizer connected to said second input of said third subtractor, where i indicates an index for a chronological sequence of signal values and q represents quantization; and
a calculating unit comprising an input connected to said second output of said quantizer to receive the second quantized DPCM signal and an output connected to said second input of said second subtractor and operable to produce at said output a signal ($A^2 \cdot s_i$) including a predicted value (s_i) multiplied by the square of the prediction factor (A).

4,541,103
DIGITALLY CONTROLLED SYLLABIC FILTER FOR A DELTA MODULATOR

Roubik Gregorian, Santa Clara, and Glenn Wegner, San Jose, both of Calif., assignors to American Microsystems, Inc., Santa Clara, Calif.

Filed Feb. 22, 1983, Ser. No. 468,608
Int. Cl.[3] H04B *12/04*
U.S. Cl. 375—32 **6 Claims**



2. A circuit comprising:
an input terminal for receiving an input signal;
a comparator having a first input lead connected to said input terminal, a second input lead, and an output lead, said comparator providing a binary digit output signal;
coincidence logic for providing a coincidence signal in response to said binary digit output signal being a logical one during each of the previous N sample periods or said binary digit output signal being a logical zero during each of the previous N sample periods, where N is a selected positive integer;
a counter coupled to said coincidence logic, the contents of said counter incrementing in response to said coincidence signal, the contents of said counter decrementing in response to the absence of said coincidence signal, said counter providing an output count indicative of the contents of said counter;
voltage means for providing a voltage on a voltage output lead in response to said count; and
first means for integrating said voltage on said voltage output lead, said first means having an output lead coupled to said second input lead of said comparator.

4,541,104
FRAMING CIRCUIT FOR DIGITAL SYSTEM

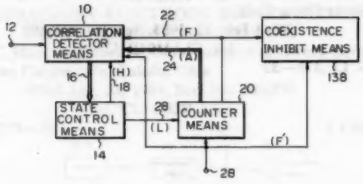
Botaro Hirosaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,729
Claims priority, application Japan, Jun. 10, 1982, 57-99704; Jun. 10, 1982, 57-99705
Int. Cl.[3] H04L *7/08*
U.S. Cl. 375—114 **3 Claims**

1. A framing system for a digital signal having a frame which is made up of an n-bit long framing pattern and m-bit long information and a clock period of T seconds, said framing system comprising:
counter means for counting clock pulses, modulo (n+m), and generating a framing pulse every time the count reaches a predetermined value K;
correlation detector means for observing an n'-bit bit pattern (n' being a positive integer not larger than n) arrived

thereat up to a given instant of observation and obtaining a correlation between the observed bit pattern and an n'-bit reference pattern to determine whether or not the observed pattern is coincident with the reference pattern; and

state control means for controlling said counter means in accordance with a state of the system, said state control means including first means for determining as a first observation time one bit time which starts at a leading end of a framing pulse appearing at every (n+m) T seconds, and defining a second observation time having a predetermined width the center of which is defined by the first observation time, second means for resetting an internal state of state control means to the initial state if an output



of the correlation detector means indicates coincidence in the first observation time, third means for changing the internal state into a hunting state under at least one of a condition wherein the output of the correlation detector means indicates uncoicidence predetermined N consecutive times in the first observation time and a condition wherein the output of the correlation detector means indicates coincidence even once in the second observation time, and fourth means for continuously observing the output of the correlation detector means in the hunting state of the state control means and loading the predetermined value K in the counter means to generate a new framing pulse upon detection of coincidence by the correlation detector means.

4,541,105

COUNTING APPARATUS AND METHOD FOR FREQUENCY SAMPLING

Charles K. Lee, Seattle; Rex B. Peters, Woodinville, and Aleksandar M. Gogic, Seattle, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Mar. 23, 1984, Ser. No. 592,657
Int. Cl.³ G01R *23/00*
U.S. Cl. 377—19 **16 Claims**

1. An apparatus for counting the number of cycles of a sensor signal and of a reference signal that occur during respective time intervals associated with a sampling interval defined by a sample signal, whereby the relationship of the frequency of the sensor signal to the frequency of the reference signal may be determined, the apparatus comprising:

gating means responsive to the sample signal and to the sensor and reference signals for producing a sensor gate signal and a reference gate signal, the sensor gate signal having a characteristic thereof that is operative to define a sensor interval that begins and ends synchronously with respect to the sensor signal, the reference gate signal having a characteristic thereof that is operative to define a reference interval that begins and ends synchronously with respect to the reference signal, the sensor, reference and sampling intervals being approximately coextensive with one another;

sensor count means for counting the number of cycles of the sensor signal that occur during the sensor interval; and

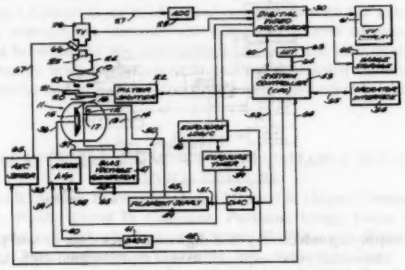
reference count means for counting the number of cycles of the reference signal that occur during the reference interval.

4,541,106

DUAL ENERGY RAPID SWITCHING IMAGING SYSTEM

Barry F. Belanger, Milwaukee, and Lawrence E. Sieb, Oconomowoc, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1984, Ser. No. 582,558
Int. Cl.³ H04N *5/32*
U.S. Cl. 378—099 **4 Claims**



1. A subtraction angiography method that uses a television (TV) camera to form images on its target corresponding to x-ray images and which camera produces vertical blanking pulses at constant periodicity to mark the beginning and end of TV frame times, said method including the steps of providing for:

exposing an anatomical region to a low average energy x-ray beam from an x-ray tube for an interval beginning with occurrence of a vertical blanking pulse and ending within a frame time and extending over less or more than one frame time while a relatively low peak kilovoltage (kVp) is applied to the anode of the tube and a predetermined current (MA) is flowing through the tube to thereby form a nominally low energy mask image on the target in the TV camera;

terminating said exposure with automatic exposure control (AEC) in response to a predetermined x-ray dose having been administered and then determining and storing the exposure time for the low energy mask image;

after the exposure is terminated, reading out the TV camera target and storing the low energy mask image;

exposing said region to a higher average energy x-ray beam for an interval beginning with occurrence of a vertical blanking pulse and ending within a frame time and extending over less or more than one frame time after the low energy exposure while higher kVp is applied to said anode and a predetermined MA is flowing through said tube to thereby form a nominally high energy mask image on the target in the TV camera;

terminating said high energy exposure with AEC in response to a predetermined x-ray dose having been administered and then determining and storing the exposure time for the high energy mask image;

after the high energy exposure is terminated reading out the TV camera target and storing the resulting high energy mask image;

then in order to make a subsequent sequence of alternating low and high energy exposures wherein the exposures at one energy are terminated coincident with a blanking pulse that initiates the first available frame time for readout of said camera target and the exposures at the other energy are started coincident with the blanking pulse at the end of said readout frame, determining the time (T_d) that elapsed between termination of the mask image exposure at said one energy and the next ensuing vertical blanking pulse demarking the end of the frame time in which said exposure terminated;

initiating each of said subsequent exposures at said one en-

ergy after a delay of T_d following occurrence of a vertical blanking pulse demarking the beginning of a frame time such that said exposures terminate coincident with a vertical blanking pulse ending a frame time;

reading out the TV camera target during the interval between said last named blanking pulse and a following vertical blanking pulse;

initiating said exposures at said other energy immediately after occurrence of said following blanking pulse and terminating the exposure at the same time that the corresponding mask image was terminated with AEC; and

reading out the TV camera target beginning with the first blanking pulse following the frame in which the exposures at said other energy terminated.

3. A method of preventing the anode target of a rotating anode x-ray tube from attaining damaging temperatues in the bulk of the target, at its focal spot and along its focal track when the tube is used for making a sequence of alternating closely successive low x-ray energy and high x-ray energy exposures, where the low energy exposures are made with a selected relatively low peak kilovoltage (kVp) applied to the target of the x-ray tube and with a selected relatively high milliamperage current (MA) flowing through the tube and the high energy exposures are made with a fixed, relatively higher kVp on the target and with relatively lower MA, said lower MA being determined by the level of the negative bias voltage applied to the grid of the x-ray tube during high energy exposures, said method comprising:

determining a first plot of decreasing maximum permissible kilovoltage (KW) or MA and low kVp product the tube target can withstand without melting at its focal spot versus increasing x-ray exposure times when said grid is unbiased so the focal spot is at its largest size;

determining for said tube a second plot of decreasing permissible KW the tube target can withstand without melting at its focal spot while said high kVp is applied to said target versus increasing exposure times where the grid has been increasingly negatively biased to produce the MA values that result in the corresponding KW values and where the power in the focal spot becomes more concentrated on said target with increasing bias voltage;

before making the sequence of exposures select the kVp and MA and exposure time desired for the low energy exposures and using the result of calculating MA and kVp product or first KW to determine what percentage this KW is of the maximum permissible KW according to said first plot where the x-ray tube grid is unbiased;

taking the same percentage of KW according to the second plot for the high kVp on the target to determine the KW allowed for the high energy exposure for the corresponding exposure time at said fixed high kVp and calculate the MA that should be used for the high energy exposures, when said x-ray tube grid is negatively biased; and

when making said low and high energy exposures apply the negative bias voltage level to said x-ray tube grid during the high energy exposures that will result in said last mentioned calculated MA flowing through said tube while said high kVp is on the x-ray tube target.

4,541,107

MOVING X-RAY MASK WITH SPIRAL WINDOW

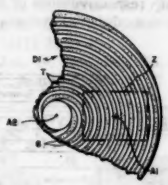
Remo J. Rossi, Billerica, Mass., assignor to John K. Grady, Littleton, Mass.

Filed Jun. 4, 1984, Ser. No. 617,312
Int. Cl.[3] G01T *1/20, 1/00;* **G01J** *1/42*
U.S. Cl. 378—146 **19 Claims**

1. An X-ray system for radiological examination of a subject comprising:

an X-ray source directing radiation on a first path through a subject position;

an X-radiation receptor on the path beyond the subject responsive to received X-rays to direct light radiation on a secondary path to a light image plane; and



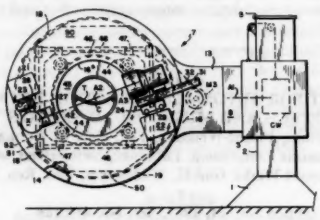
a rotating radiation-opaque mask in one of said paths including a spiral radio-transparent window sweeping through the path as the mask rotates.

4,541,108

X-RAY APPARATUS WITH TILTING TABLE

John K. Grady, Harvard, and Paul G. Rice, Lincoln, Mass., assignors to John K. Grady, Littleton, Mass.

Filed Jan. 30, 1984, Ser. No. 575,203
Int. Cl.[3] G03B *41/16;* **G01N** *21/00, 23/00;* **G03D** *11/00*
U.S. Cl. 378—196 **11 Claims**



1. X-ray apparatus comprising:

a standard;

a horizontal rotor journalled in the standard to turn about the rotor axis;

an elongate patient table mounted on the rotor with the longitudinal table axis directed transversely of the rotor axis; and

a radiation set including an X-ray source and an X-ray receptor on a radiation axis intersecting the table axis, and rotating means on the rotor to support the set for angulation of the radiation axis around the table;

whereby the head of a patient may be elevated or lowered relative to the patient's body while changing the angular relation of the radiation axis to the patient.

4,541,109

PILOT SIGNAL DETECTING CIRCUIT FOR AM STEREO SIGNALS

Yoshio Shimizu, Yokohama, and Satoshi Yokoya, Chofu, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,475
Claims priority, application Japan, Jan. 31, 1983, 58-14176
Int. Cl.[3] H04H *5/00*
U.S. Cl. 381—15 **19 Claims**

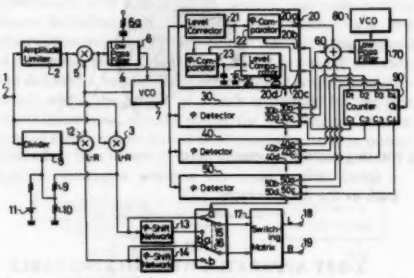
1. Apparatus for detecting and identifying a pilot signal contained in a received AM stereo signal modulated according to an unidentified one of a plurality of different AM stereo modulation systems, comprising:

AM stereo demodulator means connected to said received AM stereo signal for producing a demodulated AM stereo signal therefrom;

signal extracting means connected to said AM stereo demod-

ulator means for extracting from said demodulated AM stereo signal a signal containing said pilot signal;

means for generating a plurality of reference pilot signals corresponding to respective ones of said plurality of different AM stereo modulation systems; and



comparing means for comparing each of said plurality of reference pilot signals with said signal containing said pilot from said signal extracting means and producing an output signal upon a coincidence therebetween, said output signal identifying the one of the plurality of different AM stereo modulation systems employed in said received signal.

4,541,110

CIRCUIT FOR AUTOMATIC SELECTION BETWEEN SPEECH AND MUSIC SOUND SIGNALS

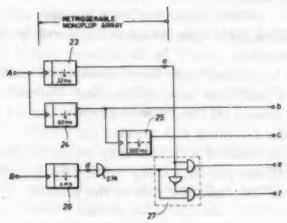
Reinhard Hopf, Placht-Weissath, Fed. Rep. of Germany, and Jean-Francois Longchamp, Lausanne, Switzerland, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Jan. 21, 1982, Ser. No. 485,188

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1981, 3102385

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—46 **20 Claims**



1. Electric circuit for automatic switching of a sound reproduction and signal apparatus for exercising a selected choice, among selectable signals, between speech and music sound reproduction signals, comprising:

means **(40)** for registering said selected choice;

means **(12,13)** for subjecting a selectable or selected sound reproduction signal, to be tested for conformance with a choice registered in said registering means, to separation of said signal into a low-frequency signal component and a high-frequency signal component, said low-frequency signal component containing substantially all component frequencies of said sound reproduction signals which are less than 3 kHz;

means **(14–19)** for converting said low-frequency and high-frequency signal components respectively into first and second sequences of amplitude-limited pulses;

first timing means **(24)** responsive to said first sequence of amplitude-limited pulses for detecting pauses in said low-frequency signal component which pauses exceed a first predetermined duration;

second timing means **(25)** for identifying periods of time in which said pauses detected by said first timing means succeed each other at intervals not exceeding a second predetermined duration;

third timing means **(26)** responsive to said second sequence of amplitude-limited pulses for detecting the occurrence of pauses in said high-frequency signal component exceeding a third predetermined duration which is less than said first predetermined duration;

fourth timing means **(23)** responsive to said first sequence of amplitude-limited pulses for detecting the occurrence of pauses in said low-frequency signal component exceeding a fourth predetermined duration which is longer than said third predetermined duration and shorter than said first predetermined duration;

first logic circuit means **(27,27*a*)** responsive to the outputs (a,d) of said first and fourth timing means for detecting the absence of a pause exceeding said third predetermined duration in said high-frequency signal component during the portion of a pause in said low-frequency signal component which exceeds said fourth predetermined duration and thereby producing a first logic output signal (e) and for detecting the absence of a pause exceeding said third predetermined duration in said high-frequency signal component during the absence of pauses exceeding said fourth predetermined duration in said low-frequency signal component and thereby producing a second logic output signal (f);

second logic circuit means **(31)** for dientifying a music signal by a third logic output signal (h) with reference to the respective states of said first and second logic output signals (e,f) and the state of the output (c) of said second timing means **(25)** and for identifying a speech signal by a fourth logic signal (i) with a reference to the respective states of said first and third logic signals (e,h) and the respective states of the outputs (b,c) of said first and second timing means **(24,25)**, and

sound reproduction signal evaluating means **(33–39)** for comparing the state of said registering means **(40)** with the corresponding one of said third and fourth logic signals and determining in response thereto whether or not the sound reproduction signal selected for test is of the character selected by said registering means.

4,541,111

LSP VOICE SYNTHESIZER

Susumu Takashima; Takao Kanke; Naoki Inagaki, and Kazumasa Fukushima, all of Tokyo, Japan, assignors to Casio Computer Co. Ltd., Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,140

Claims priority, application Japan, Jul. 16, 1981, 56-111428

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—51 **5 Claims**

1. An LSP voice synthesizer, comprising:

a memory for storing various voice parameters necessary to LSP voice synthesis;

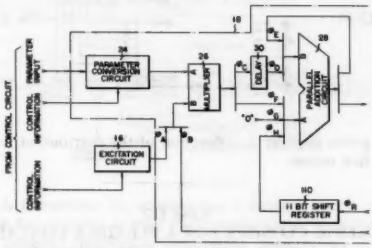
controlling means, coupled to said memory, for reading out a predetermined voice parameter in accordance with external input data;

excitation means, coupled to said controlling means, for producing excitation information in accordance with the predetermined voice parameter received from said controlling means;

LSP voice synthesizing means, coupled to said controlling means and to said excitation means and comprising a plurality of parallel operating circuits, each of which includes a parallel multiplier circuit for dividing input data into upper bits and lower bits, and for multiplying the upper and the lower bits separately at specified different timings to obtain a partial product of the upper bits and a

partial product of the lower bits, delay circuits and shift registers, for performing LSP voice synthesis by parallel processing of the predetermined voice parameter received from said controlling means and the excitation information received from said excitation means;

D/A converting means, coupled to said LSP voice synthesizing means, for converting a digital output from said LSP voice synthesizing means to an analog signal; and



timing signal generating means, coupled to said controlling means and to said LSP voice synthesizing means for generating a predetermined timing signal to each one of said controlling means, said LSP voice synthesizing means, and said excitation means, on the basis of an externally supplied clock pulse.

4,541,112

ELECTROACOUSTIC TRANSDUCER SYSTEM

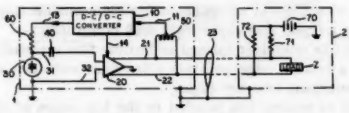
Otmar Kern, Berlin, Fed. Rep. of Germany, assignor to Georg Neumann GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 14, 1983, Ser. No. 504,309

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1982, 3222295

Int. Cl.³ H04R *3/00*; H04K *17/04*; H02M *3/335*

U.S. Cl. 381—113 **12 Claims**



1. An electroacoustic transducer system comprising:

a capacitive microphone with a high-impedance operating circuit;

an amplifier connected across said operating circuit and provided with an input, said amplifier having an output circuit connected across an alternating-current load;

a source of direct current connected to said output circuit and with said load;

coupling means connected to said output circuit at a location remote from said source for extracting said direct current;

a d-c/d-c converter connected to said coupling means for deriving from said direct current a first and a second unipolar voltage; and

conductor means connected to said converter for supplying said first unipolar voltage to a biasing terminal of said operating circuit and said second unipolar voltage to said input, said converter being provided with a feedback connection from said conductor means for supplying said second unipolar voltage to assure a perfect impedance matching between said amplifier output circuit and said load.

4,541,113

APPARATUS AND METHOD OF LINE PATTERN ANALYSIS

Wolf D. Seufert, R.R. 5, Sherbrooke, Québec, Canada (J1H 5H3), and Roger A. Coté, 1229, rue Joques, Sherbrooke, Québec, Canada (J1H 2Y2)

Filed Jan. 19, 1983, Ser. No. 459,144

Int. Cl.³ G06K *9/00*

U.S. Cl. 382—4 **18 Claims**

1. A method of analysis of a line pattern comprising the steps of:

superimposing a centrosymmetric reference pattern of lines over the line pattern to be analysed to form an interferometric pattern of the moiré type;

positioning said reference pattern on a characteristic element of said line pattern to be analysed by gradually enlarging the reference pattern until the lines thereof fill the space between adjacent lines closest to said characteristic element to thereby translate said superimposed line patterns into a field pattern of different optical densities; and

electronically measuring said optical densities.

4,541,114

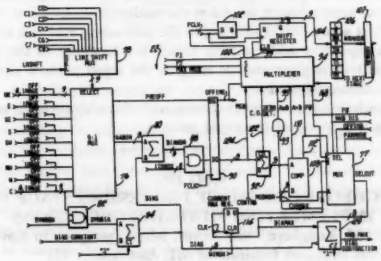
ROUTING TECHNIQUES USING SERIAL NEIGHBORHOOD IMAGE ANALYZING SYSTEM

Robin A. Rutenbar, and Robert M. Lougheed, both of Ann Arbor, Mich., assignors to Research Environmental/Institute of Michigan, Ann Arbor, Mich.

Filed May 5, 1983, Ser. No. 491,945

Int. Cl.³ G06K *9/36*

U.S. Cl. 382—8 **9 Claims**



1. A method of automatically laying out conductor paths between source and target areas on a circuit represented by an image containing pixels having preselected values associated with source, target, free and blocked areas of the circuit, said method comprising:

(a) feeding the pixels of the image in a serial manner to an input of a neighborhood transformation stage, said stage including neighborhood extraction means for sequentially accessing each neighborhood of pixels in the image, the stage further including neighborhood transformation logic means, operative to selectively provide a transfor-

mation output for the stage as a function of the values of a center pixel and its surrounding neighbor pixels in each extracted neighborhood;

(b) performing a grow out step using the neighborhood transformation logic means to transform free pixels in the image between the source and target to values associated with arrows pointing back towards the source;

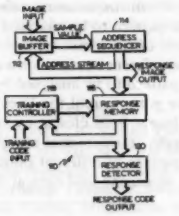
(c) performing a trace back step by changing the arrow pixels between the target and source to given values associated with a conductor path between the target and source; and

(d) performing a clean up step by changing the conductor path pixels to values associated with blocked areas of the circuit thereby producing an image that may be utilized to lay out other conductors on the circuit.

4,541,115
PATTERN PROCESSING SYSTEM

Larry J. Werth, Eagan, Minn., assignor to Pattern Processing Technologies, Inc., Minneapolis, Minn.

Filed Feb. 8, 1983, Ser. No. 465,008
Int. Cl.³ G06K *9/70*
U.S. Cl. 282—14 **30 Claims**



1. A method of associating an input pattern with an output response, wherein the input pattern comprises a plurality of sample values, the method comprising:

producing the sample values based upon the input pattern;

storing the sample values of the input pattern in a first array of addressable locations;

sequentially addressing the first array with a sequence of addresses in which each next address of the sequence is determined by a preceding address of the sequence and the sample value stored at the addressable location of the first array corresponding to the preceding address, so that a repetitive address loop which is a function of the input pattern is generated as long as the input pattern remains unchanged; and

associating the output response with the address loop which is a function of the input pattern.

4,541,116
NEIGHBORHOOD IMAGE PROCESSING STAGE FOR IMPLEMENTING FILTERING OPERATIONS

Robert M. Lougheed, Ann Arbor, Mich., assignor to Environmental Research Institute of MI, Ann Arbor, MI

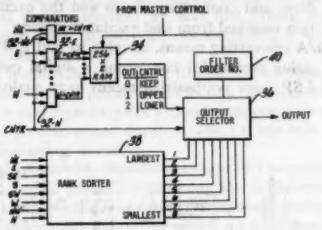
Filed Feb. 27, 1984, Ser. No. 583,662
Int. Cl.³ G06K *9/36*
U.S. Cl. 382—49 **10 Claims**

1. In a neighborhood transformation stage having neighborhood extraction means for sequentially accessing a group of pixel values in an image matrix, the improvement comprising:

first means for comparing the values of neighboring pixels with the value of a given pixel in the group and providing a first output as a function of the comparison;

sorting means for comparing the values of the neighboring pixels with each other and providing a series of outputs in a predetermined order according to relative positions of the values of the neighboring pixels; and

selector means for selecting as its output the value of the given pixel or the value of a neighboring pixel ranked in a

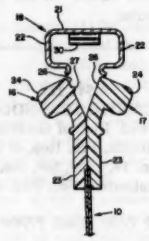


given position as a function of the first output from the first means.

4,541,117
SEALING CLOSURE FOR A FLEXIBLE CONTAINER

Robert M. Ashbeck, Bakersfield, Calif., assignor to Martin I. Davis, Bakersfield and Kenneth M. Dewing, Porterville, both of, Calif., part interest to each

Filed Jul. 28, 1983, Ser. No. 518,299
Int. Cl.³ B65D *33/00*
U.S. Cl. 383—64 **2 Claims**



1. A closable and re-openable flexible container capable of forming a liquid and vapor tight seal, comprising:

a bag-like container formed of flexible film material, closed at a bottom edge and two side edges and open at a top comprising two top edges;

a pair of sealing lips bonded to the top edges of the container, continuous along the edges, the lips being formed of resilient material and being preformed in an outwardly bowed configuration to normally resiliently bow outwardly to hold the container top open, for aiding in putting material into the container, one of the sealing lips having an inside surface with at least one raised ridge continuous through the length of the lip, the opposite lip having a generally flat mating inside surface free of recesses to avoid contamination by substances stored in the container, the raised ridge being positioned to be compressed against and depressed into the opposite flat lip surface when the closure strip is advanced toward the closed position, to provide a better seal;

a slidable, generally channel-shaped, relatively rigid closure strip having a pair of depending flanges spaced apart and positioned to compress the resilient lips together along their full length when the closure strip is advanced longitudinally over the lips, the flanges being shaped generally complementarily to the exterior of the lips for gripping retention thereon, and the closure strip including a handle portion extending from one end; and

a grip comprising a pull tab formed integrally with the sealing lips and extending from one end thereof, for en-

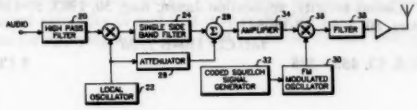
abling a user to pull the sealing lips slideably into the closure strip.

4,541,118

SSB SYSTEM WITH PILOT CODED SQUELCH

Bruce C. Eastmond, Downers Grove, Ill., and Julian H. Richardson, Clevedon, England, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1983, Ser. No. 564,815
Int. Cl.³ H04B *7/00, 1/04, 1/16*
U.S. Cl. 455—35 **36 Claims**



24. A transmitter for transmitting a message and a coded squelch for enabling at least one predetermined receiver in a single sideband communications system, comprising:

means for creating a single sideband signal modulated by the message;

means for generating a pilot and combining it with said single sideband signal;

means for further combining said combined signal with a coded squelch signal to derive a single sideband radio frequency signal angle modulated at a predetermined deviation with said coded squelch signal; and

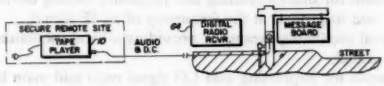
means for transmitting said radio frequency signal.

4,541,119

PORTABLE BROADCAST BAND INFORMATION TRANSMITTING SYSTEM

John R. Cooper, 5935 S. Newberry, and Richard G. Sawyer, 5930 S. Bonarden, both of Tempe, Ariz. 85283

Filed Oct. 3, 1984, Ser. No. 657,189
Int. Cl.³ H04B *1/00, 1/03*
U.S. Cl. 455—57 **18 Claims**



1. A portable system for transmitted information over a modulated RF output signal to a vehicle-mounted broadcast band receiver, comprising:

a. A portable advertising sign positioned adjacent to a publicly accessible street and including a message board; said sign including electrically conductive upper and lower section physically interconnected by an electrical isolating means

b. a tunable low power transmitter physically secured to said isolating means and concealed within a cavity in said sign for generating a modulated RF output signal at a predetermined frequency within the broadcast band, said transmitter including an RF output stage and continuously variable tuning means for repositioning the transmitter output frequency to a clear channel within the broadcast hand;

c. an above-ground antenna formed by said upper and lower sections of the portable advertising sign and having an effective length of less than or equal to three meters coupled directly to the RF output stage of said transmitter for radiating the modulated RF output signal from said transmitter;

d. a portable cassette tape player positionable in a selectable secure area physcially spaced apart from said sign by a substantial distance exceeding fifteen feet, said tape player including an endless loop cassette for generating a repeating audio output signal;

e. a power supply colocated with said tape player for converting AC power from a commercial source to a DC voltage suitable for energizing both said remotely located transmitter and said colocated tape player;

f. a portable cable exceeding fifteen feet in length coupled at a first end to receive both the audio output signal from said tape player and the DC voltage from said power supply and at a second end to said transmitter for conveying both the DC voltage and audio output signal over the distance between said tape player and said transmitter;

g. quick disconnect means for enabling the first end of said cable to be readily connected to and disconnected from said tape player; and

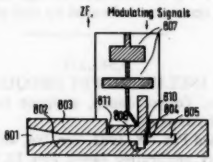
h. said sign message board indicating the operating frequency of said transmitter.

4,541,120

TRANSMITTER-RECEIVER MODULE

Laszlo Szabo, Korntal, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 16, 1983, Ser. No. 523,545
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230832
Int. Cl.³ H04B *1/40*
U.S. Cl. 455—86 **7 Claims**



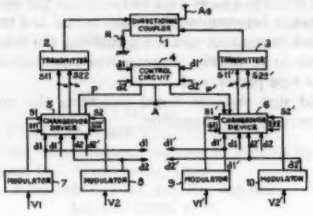
6. A transmitter-receiver module providing an IF signal when receiving, and a transmitter signal when transmitting, and including an antenna, an oscillator used as a signal source during transmitting and as a local oscillator during receiving, a coupler having four terminals one of which is connected to the oscillator, another one to the antenna, and each of the remaining two to one diode, the two diodes being used as a modulator during transmitting and as a mixer during receiving, characterized in that the oscillator, the coupler, and the mixer-modulator are implemented in fin-line form, that the fin-line oscillator for electromagnetic waves contains a two-terminal device **(103)** as an active element and an impedance-matching network **(403)** for matching the two-terminal device to a load A, that the impedance-matching network is formed by a coupler **(403)** having four terminals **(203, 303, 703, 803)**, that two of the terminals **(703, 803)** are terminated with impedances for adjusting/continuously varying the output power and the frequency, that another of the terminals **(303)** is terminated with a further impedance **(103)** equal to the characteristic impedance of the coupler, and that the fourth terminal **(203)** is connected to the two-terminal device **(103)** on one side and to the oscillator ouptput (A) on the other.

4,541,121

CHANGEOVER DEVICE FOR SELECTING ONE MODULATOR OUT OF TWO AND CONNECTING IT INTO A TRANSMITTER

Guy Blum, Montmagny, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 8, 1983, Ser. No. 559,350
Claims priority, application France, Dec. 10, 1982, 82 20765
Int. Cl.³ H04B 1/04
U.S. Cl. 455—103 **2 Claims**



1. A changeover device for selecting one modulator out of two and connecting the selected modulator into a first transmitter, one of the two modulators being the modulator associated with the first transmitter and the other modulator being the modulator associated with a second transmitter, said device comprising: means for directly receiving any fault signals from the two modulators and control signals, said control signals being representative of the modulator to be connected into the first transmitter; electronic means for producing changeover signals as a function of the signals received by the fault signals receiving means, said changeover signals indicating the particular modulator out of the two which is to be connected into the first transmitter, the modulator thus indicated being the one which is operating correctly whenever fault signals show that only one of the two modulators is defective, and an electronic switch for receiving the changeover signals and carrying out the connecting operation indicated by said changeover signals

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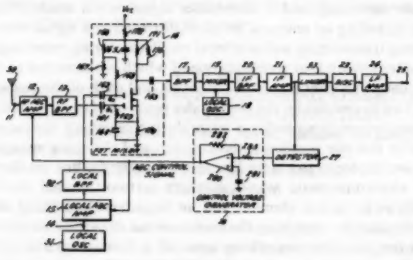
4,541,122

RECEIVER INCLUDING FET FREQUENCY MIXER

Katsuji Kimura, Tokyo, Japan, assignor to Nippon Electric Company Ltd., Japan

Filed Feb. 18, 1983, Ser. No. 467,790
Claims priority, application Japan, Feb. 22, 1982, 57-24444[U]
Int. Cl.³ H04B 1/26
U.S. Cl. 455—236 **5 Claims**



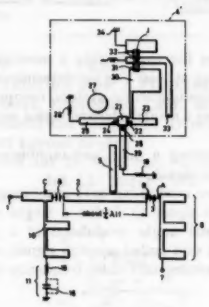
1. A receiver comprising: an FET frequency mixer means having first and second gate electrodes biasing means providing substantially constant dc bias voltages to said mixer means local oscillator means for generating a local oscillator signal; first AGC amplifier means coupled to said first gate electrode for varying the level of a high frequency signal received by said receiver in response to a control signal; second AGC amplifier means coupled to said second gate electrode and said local oscillator means for varying the level of the said local oscillator signal in response to said control signal; and generator means responsive to the output of said FET mixer means for generating said control signal in order to expand the dynamic range of said FET frequency mixer means.

4,541,123

MIXER CIRCUIT

Hiroshi Saka, Katano City, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 25, 1983, Ser. No. 526,279
Claims priority, application Japan, Aug. 30, 1982, 57-150558; Aug. 30, 1982, 57-150561
Int. Cl.³ H04B 1/26
U.S. Cl. 455—325 **5 Claims**



1. A mixer circuit comprising:
RF input means for receiving RF signals;
a main line having first and second ends, said first end being connected to said RF input means;
a frequency mixing device having first and second ends, said frequency mixing device first end being connected to said main line second end;
means for short-circuiting said frequency mixing device first end to ground at the frequency of an IF signal;
local oscillating means for providing a local oscillator (LO) signal;
means for impressing said LO signal onto said main line;
filter means, connected to said frequency mixing device second end, for passing only IF signals having a frequency which is equal to a difference between RF and LO signal frequencies;
IF interruption means, provided in said main line, for passing said RF signal but impeding said IF signal; and
resonance damping means, connected to said main line between said RF input means and said IF interruption means, for damping a resonance in a frequency range of said IF signal.

4,541,124

MICROWAVE MIXER

Clément F. Lacour, and Yannick Latouche, both of Paris, France, assignors to Thomson CSF, Paris, France

Filed Jun. 3, 1983, Ser. No. 500,863
Claims priority, application France, Jun. 8, 1982, 82 09957
Int. Cl.³ H04B 1/26
U.S. Cl. 455—327 **9 Claims**

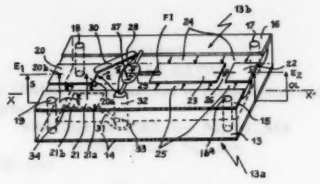
1. A microwave mixer for producing a mixed wave from an incident wave and a mixing wave, comprising:
a dielectric substrate having a first and a second end, and a first and a second face in parallel;
a ground strip line conductor located on the periphery of said first face;

a first strip conductor, having a first extremity and a second extremity, located on said first face near said first end so as to define a gap between said ground strip line conductor and said first extremity of said first strip conductor;

a second strip conductor, having a first extremity and a second extremity, located on said second face at said first end so as to be substantially parallel with said first strip conductor, whereby said incident wave is applied between said first extremity of said second strip conductor and said ground strip line conductor;

first and second series connected diodes, each having an anode and a cathode, said anode of said first diode being connected to said second extremity of said second strip conductor, and said cathode of said second diode being connected to said second extremity of said first strip conductor;

means for applying an electric field produced by said mixing wave between said anode of said first diode and said cathode of said second diode; and



output means, connected between said first diode anode and said second diode cathode, for providing said mixed wave.

DESIGNS

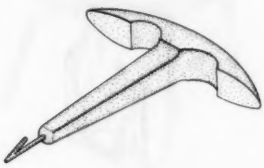
SEPTEMBER 10, 1985

280,460
FACE PROTECTING MASK
Jan Grönborg, Huddinge, and Lars Persson, ÅKersberga, both of Sweden, assignors to Svensk Sportutveckling AB, Sweden
Filed Dec. 14, 1982, Ser. No. 449,569
Claims priority, application Sweden, Sep. 8, 1982, 82-2150
Term of patent 14 years
U.S. Cl. D2—233

280,461
SCUFF
Dieter H. G. Horn, 142 Coolgardie Ave., Redcliffe, Western Australia, Australia
Filed Apr. 13, 1982, Ser. No. 367,945
Claims priority, application Australia, Oct. 16, 1981, 85504
Term of patent 14 years
U.S. Cl. D2—282

280,462
BASEBALL GLOVE
Akio Aoki, Osaka, Japan, assignor to Figgie International Inc., Willoughby, Ohio
Filed Jun. 24, 1983, Ser. No. 507,519
Term of patent 14 years
U.S. Cl. D2—361

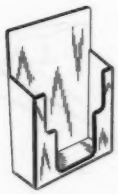
280,463
ZIPPER PULL
Mary P. Sheahan, 26140 W. 12 Mile Rd., Southfield, Mich. 48034
Filed Nov. 14, 1983, Ser. No. 550,829
Term of patent 14 years
U.S. Cl. D2—415



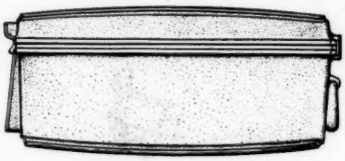
280,464
BELT BUCKLE
Richard J. Casull, Box 276, Freedom, Wyo. 83120
Filed Aug. 19, 1982, Ser. No. 409,570
Term of patent 14 years
U.S. Cl. D2—431

280,465
VIDEO RECORDER BAG
Frank M. Baum, 1030 E. 30th St., Hialeah, Fla. 33013
Filed May 5, 1983, Ser. No. 491,733
Term of patent 14 years
U.S. Cl. D3—33

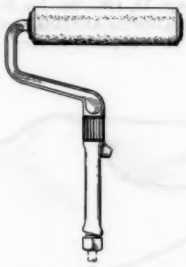
280,466
HOLDER FOR A GARAGE DOOR REMOTE CONTROL UNIT
Samuel M. Seltzer, and Saul Dennison, both of Livingston, N.J., assignors to Allison Corporation, Livingston, N.J.
Filed Mar. 14, 1983, Ser. No. 475,062
Term of patent 14 years
U.S. Cl. D3—40



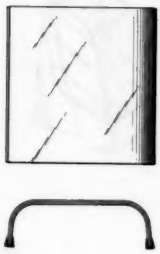
280,467
SUITCASE
Steven Mihojevich, Elkhart, Ind., assignor to Continental Industries, Inc., Elkhart, Ind.
Filed Aug. 19, 1983, Ser. No. 524,563
Term of patent 14 years
U.S. Cl. D3—76



280,468
HANDLE FED PAINT ROLLER OR SIMILAR ARTICLE OF MANUFACTURE
David C. Miller; Robert E. Dawson, both of Ridgefield; Thomas J. Pendleton, North Wilton, and Jacob A. Krapowicz, Ridgefield, all of Conn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.
Filed Aug. 15, 1983, Ser. No. 523,381
Term of patent 14 years
U.S. Cl. D4—122



280,469
PICTURE FRAME
Gerard Heyman, 425 Park Ave. South, New York, N.Y. 10016, and Edwin Schwimmer, 118-21 Queens Blvd., Forest Hills, N.Y. 11375
Filed Jul. 7, 1983, Ser. No. 511,557
Term of patent 14 years
U.S. Cl. D6—314



280,470
VAN SEAT
Bob J. Higgins, Elkhart, Ind., assignor to Trans-Aire International, Inc., Elkhart, Ind.
Filed May 13, 1983, Ser. No. 494,441
Term of patent 14 years
U.S. Cl. D6—356

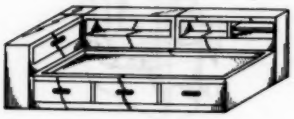
280,471
VAN SEAT
Bob J. Higgins, Elkhart, Ind., assignor to Trans-Aire International, Inc., Elkhart, Ind.
Filed May 13, 1983, Ser. No. 494,442
Term of patent 14 years
U.S. Cl. D6—356

280,472
SEAT FOR AN AUTOMOBILE
Hisashi Seto, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Mar. 1, 1983, Ser. No. 470,948
Term of patent 14 years
U.S. Cl. D6—356

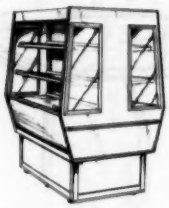
280,473
CHAIR
Paul H. Parker, Box 132 R.F.D., Poultney, Vt. 05764
Filed Mar. 31, 1983, Ser. No. 480,744
Term of patent 14 years
U.S. Cl. D6—379

280,474
CHAIR
Robert D. Vanderminden, Court St., Granville, N.Y. 12832
Filed Mar. 31, 1983, Ser. No. 480,750
The portion of the term of this patent subsequent to Jun. 18, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—380

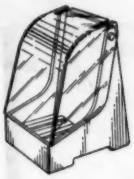
280,475
BED ASSEMBLY OR SIMILAR ARTICLE
Stefano Testa, New Providence, N.J., assignor to Essex Chair Company, Union, N.J.
Filed Nov. 29, 1982, Ser. No. 445,446
Term of patent 14 years
U.S. Cl. D6—384



280,476
REFRIGERATED DISPLAY CASE
John P. McMahon, and J. Patrick McMahon, both of Fairfield, Iowa, assignors to Barker Company, Ltd., Keosauqua, Iowa
Filed Aug. 16, 1983, Ser. No. 523,548
Term of patent 14 years
U.S. Cl. D6—470



280,477
CARD DISPLAY HOLDER
John Petrick, V, 7702 Daytona Dr., Parma, Ohio 44134
Filed Sep. 1, 1983, Ser. No. 528,412
Term of patent 14 years
U.S. Cl. D6—472



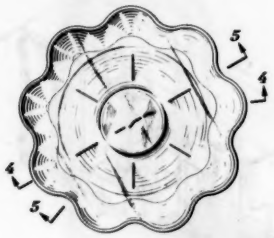
280,478
DUAL SURFACE SUPPORT STAND FOR AN OFFICE TERMINAL AND KEYBOARD
William I. Stephens, East Greenville, Pa., assignor to Knoll International, Inc., New York, N.Y.
Filed Jun. 10, 1982, Ser. No. 386,996
Term of patent 14 years
U.S. Cl. D6—477

280,479
AUXILIARY TOWEL BAR
William O. Williams, and Stephen D. Williams, both of 5139 N. Poplar, Fresno, Calif. 93704
Filed Apr. 12, 1983, Ser. No. 484,206
Term of patent 14 years
U.S. Cl. D6—548

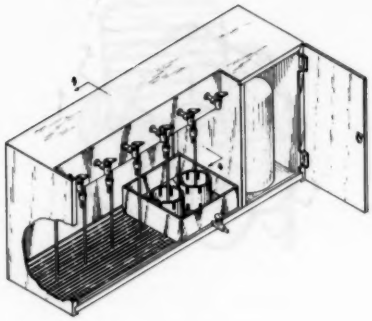
280,480
WALL MOUNTED CABINET
R. Scott Bromley, New York, N.Y., assignor to Cartier, Inc., New York, N.Y.
Filed Oct. 7, 1982, Ser. No. 433,356
Term of patent 14 years
U.S. Cl. D6—559

280,481
SLIPCOVER
Cecil E. Kornegay, Mount Olive, N.C., assignor to Reeves Brothers, Inc., Spartanburg, S.C.
Filed Jan. 5, 1983, Ser. No. 455,883
Term of patent 14 years
U.S. Cl. D6—611

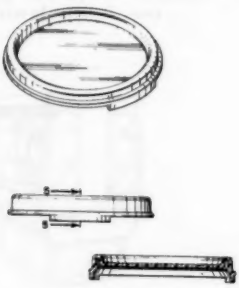
280,482
BOWL
Lawrence M. Knutson, Prior Lake, Minn., assignor to Decra-Stone, Inc., Prior Lake, Minn.
Filed Jun. 17, 1982, Ser. No. 389,166
The portion of the term of this patent subsequent to Apr. 6, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—29



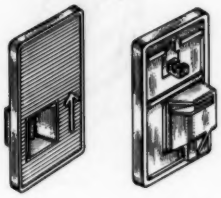
280,483
PORTABLE WINE BAR
Norman H. Schlesinger, 418 Richland La., Pittsburgh, Pa. 15203
Filed Aug. 19, 1982, Ser. No. 409,647
Term of patent 14 years
U.S. Cl. D7—308



280,484
COVER FOR A FOOD STORAGE CONTAINER OR THE LIKE
Rino Conti, Stoughton, Mass., and Robert H. C. M. Daenen, Hekelgem, Belgium, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 10, 1982, Ser. No. 406,846
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—391



280,485
SWITCHPLATE FOR CIRCUIT BREAKER COMPARTMENTS
Andre J. M'Sadoques, Southington, and John A. Morby, Farmington, both of Conn., assignors to General Electric Company, New York, N.Y.
Filed Jan. 17, 1983, Ser. No. 459,001
Term of patent 14 years
U.S. Cl. D8—353



280,486
BOTTLE
Eric T. Reay, 36 Longbourne Crescent, Brampton, Ontario, Canada L6S 2R9
Filed Apr. 1, 1983, Ser. No. 481,409
Term of patent 14 years
U.S. Cl. D9—347

280,487

BOTTLE

James Lane, Unionville, and Rod Straker, Toronto, both of Canada, assignors to The Drackett Company, Cincinnati, Ohio

Filed Jun. 14, 1983, Ser. No. 504,209

Claims priority, application Canada, Jan. 13, 1983, 13-01-83-2

Term of patent 14 years

U.S. Cl. D9—376

280,488

BOTTLE

James Lane, Unionville, and Rod Straker, Toronto, both of Canada, assignors to The Drackett Company, Cincinnati, Ohio

Filed Jun. 14, 1983, Ser. No. 504,210

Claims priority, application Canada, Jan. 13, 1983, 13-01-83-1

Term of patent 14 years

U.S. Cl. D9—376

280,489

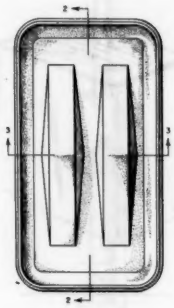
PACKAGING TRAY

M. James Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,436

Term of patent 14 years

U.S. Cl. D9—425



280,490

PACKAGING CONTAINER

Frank S. Tyler, Seven Oaks, England, assignor to Lever Brothers Company, New York, N.Y.

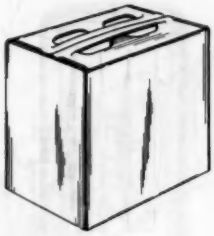
Filed Jan. 11, 1983, Ser. No. 457,305

Claims priority, application United Kingdom, Jul. 16, 1982, 1007779

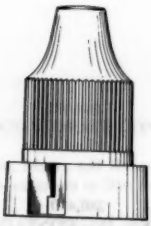
Term of patent 14 years

U.S. Cl. D9—425

280,491
CARTON
John C. Nielsen, St. Clair, Australia, assignor to Visymonde Investments PTE Ltd., Singapore
Filed Sep. 24, 1982, Ser. No. 423,471
Claims priority, application Australia, Jan. 15, 1982, 86,267
Term of patent 14 years
U.S. Cl. D9—432



280,492
CONTAINER CLOSURE
Donald Greaves, 3, Cringleford Chase, Colney La., Cringleford, Norwich NR4 7RS, and Michael Witt, 10 Butterfield Rd., Wheathampstead, Hertfordshire, both of England
Filed May 23, 1983, Ser. No. 496,998
Claims priority, application United Kingdom, Nov. 4, 1982, 1009897
Term of patent 14 years
U.S. Cl. D9—453

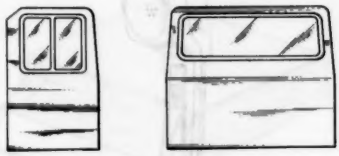


280,493
SCRIBER TOOL
Howard B. Johnson, 1620 C Ackerman Dr., Lodi, Calif. 95240
Filed Mar. 24, 1983, Ser. No. 478,407
Term of patent 14 years
U.S. Cl. D10—73

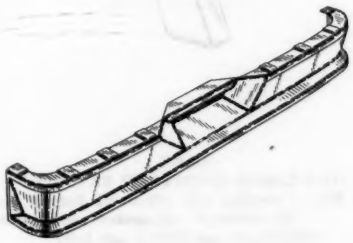
280,494
HOUSING FOR A PERSONAL TRANSMITTER FOR USE IN AN EMERGENCY ALARM SYSTEM
William E. Abel, Portland, Oreg., assignor to Sentrol, Inc., Portland, Oreg.
Filed Sep. 26, 1983, Ser. No. 535,943
Term of patent 14 years
U.S. Cl. D10—106

280,495
MOTORCYCLE VALVE COVER
Alwin J. Stahel, St. Paul, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.
Filed Jun. 20, 1983, Ser. No. 505,864
Term of patent 14 years
U.S. Cl. D12—126

280,496
ADD-ON CAB FOR A TRUCK BODY OR SIMILAR ARTICLE
William H. Rohrbacher, 701 S. State St., Hemet, Calif. 92343
Filed Mar. 4, 1983, Ser. No. 472,106
Term of patent 14 years
U.S. Cl. D12—156



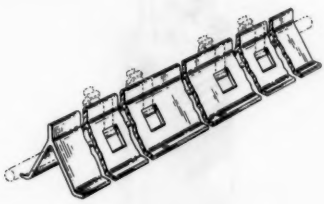
280,497
COMBINED AIR DEFLECTOR AND STEP FOR MOUNTING BELOW THE FRONT BUMPER OF A TRUCK
Patrick F. Sullivan, 3645 Glen Oak, Eugene, Oreg. 97405, and Russell R. Wakefield, 5535 Cody, Eugene, Oreg. 97402
Filed Feb. 23, 1983, Ser. No. 468,946
Term of patent 14 years
U.S. Cl. D12—181



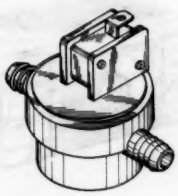
280,498
PEDAL-BOAT
Clément Lacasse, 400 - 6th St., Daveluyville, Canada G0Z 1C0
Filed Feb. 7, 1983, Ser. No. 464,526
Term of patent 14 years
U.S. Cl. D12—306

280,499
SAILBOARD MAST TRACK
Gary Fontaine, 1280 Los Rios, Carmichael, Calif. 95608
Filed Mar. 16, 1983, Ser. No. 475,721
Term of patent 14 years
U.S. Cl. D12—317

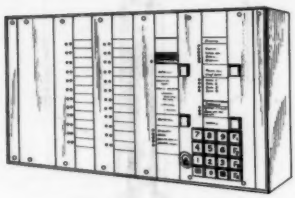
280,500
GUY WIRE MARKER
Leonard J. Brooks, Jr., Jackson Township, Susquehanna County, and Richard C. Sawyer, Jr., Chestnut Hill Township, Philadelphia County, both of Pa., assignors to McGraw-Edison Company, Rolling Meadows, Ill.
Filed Jan. 17, 1983, Ser. No. 458,275
Term of patent 14 years
U.S. Cl. D13—13



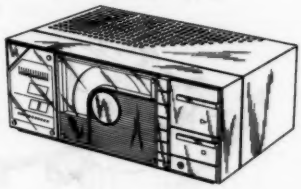
280,501
PRESSURE-RESPONSIVE SWITCH
Raymond J. H. Walters, East Victoria Park, Australia, assignor to Values Pty. Ltd., Australia
Filed Feb. 17, 1983, Ser. No. 467,440
Term of patent 14 years
U.S. Cl. D13—32



280,502
CONTROL PANEL FOR A TERMINAL
Otto Meier, Hombrechtikon, and Felix Huber, Meilen, both of Switzerland, assignors to Cerberus A.G., Mannedorf, Switzerland
Filed Dec. 6, 1982, Ser. No. 447,279
Term of patent 14 years
U.S. Cl. D13—35



280,503
AUDIO DISC PLAYER
Noboru Onozaki, Tokyo, and Hiroshi Yamada, Kunitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 9, 1982, Ser. No. 448,273
Claims priority, application Japan, Mar. 19, 1982, 57-10954
Term of patent 14 years
U.S. Cl. D14—1



280,504
HANDSET TELEPHONE
Wesley F. Walker, Jr., Ringgold, Ga., assignor to Walker Equipment Corporation, Ringgold, Ga.
Filed Mar. 18, 1983, Ser. No. 476,647
Term of patent 14 years
U.S. Cl. D14—53

280,505

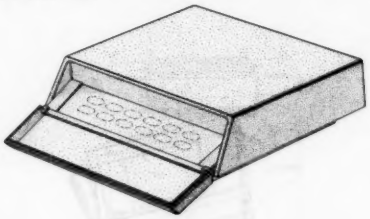
TELEPHONE STAND

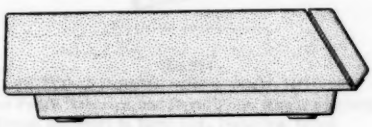
Donald M. Genaro, Haworth, N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 23, 1983, Ser. No. 468,945

Term of patent 14 years

U.S. Cl. D14—60





280,506

MODULAR TELEPHONE DIALER UNIT

Michael Mitchell, Huntsville, Ala., assignor to GTE Business Communication Systems Inc., Northlake, Ill.

Filed May 2, 1983, Ser. No. 490,913

Term of patent 14 years

U.S. Cl. D14—62

280,507

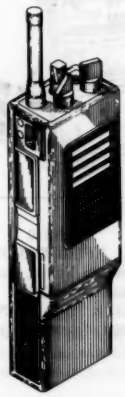
PORTABLE TWO-WAY RADIO OR SIMILAR ARTICLE

Bruce A. Claxton, Coral Springs, Fla., and Richard K. Althans, Long Grove, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

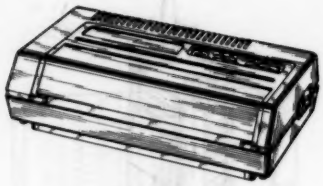
Filed Jun. 23, 1983, Ser. No. 507,313

Term of patent 14 years

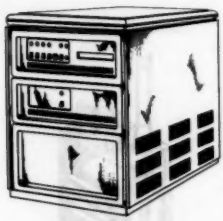
U.S. Cl. D14—68



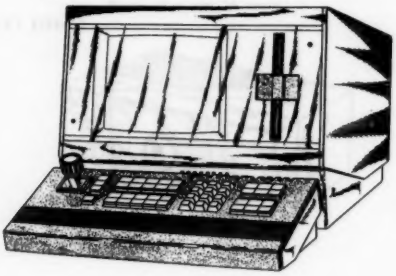
280,508
FACSIMILE
Sadao Nasui, Tokyo, and Toshio Tanaka, Zama, both of Japan, assignors to Toshiba Electric Appliances Co., Ltd., Maebashi, Japan
Filed Aug. 16, 1983, Ser. No. 524,122
Claims priority, application Japan, Mar. 18, 1983, 57-11426
Term of patent 14 years
U.S. Cl. D14—94



280,509
ENCLOSURE FOR DATA PROCESSING SYSTEM
Jerry C. Marino, Sudbury, and Steven W. Collins, Franklin, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.
Filed Feb. 9, 1983, Ser. No. 465,323
Term of patent 14 years
U.S. Cl. D14—102

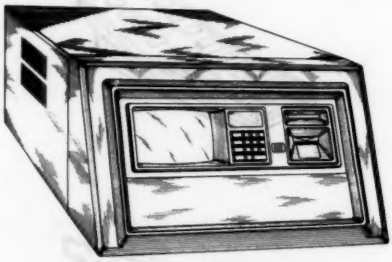


280,510
VIDEO SPECIAL EFFECTS EDITING CONSOLE
George A. Wilson, Portola Valley, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Mar. 1, 1982, Ser. No. 353,702
Term of patent 14 years
U.S. Cl. D14—106

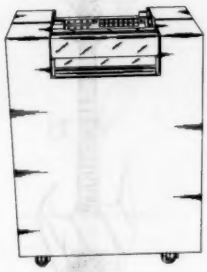


280,511
PORTABLE COMPUTER
William G. Moggridge, Palo Alto; David C. Paulsen, Santa Clara; Glenn T. Edens, Menlo Park, and Stephen R. Hobson, Palo Alto, all of Calif., assignors to Grid Systems Corporation, Mountain View, Calif.
Filed Oct. 18, 1982, Ser. No. 435,128
Term of patent 14 years
U.S. Cl. D14—106

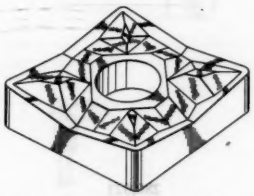
280,512
CONSUMER TRANSACTION TERMINAL
Richard B. Hall, North Canton, Ohio, assignor to Diebold, Incorporated, Canton, Ohio
Filed May 26, 1983, Ser. No. 498,580
Term of patent 14 years
U.S. Cl. D14—106



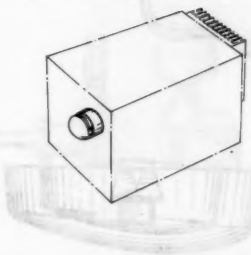
280,513
PRINTER
Wolfgang Fischer, and Fritz Hilpert, both of Boeblingen, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 19, 1982, Ser. No. 442,987
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 5451
Term of patent 14 years
U.S. Cl. D14—111



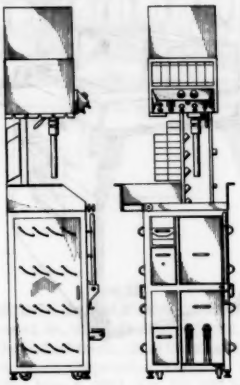
280,514
CUTTING INSERT FOR A TOOL HOLDER
Reuven Porat, Nahariya, and David Tzola, Kiryat Motzkin, both of Israel, assignors to Iscar Ltd., Nahariya, Israel
Filed Aug. 26, 1982, Ser. No. 411,795
Term of patent 14 years
U.S. Cl. D15—139



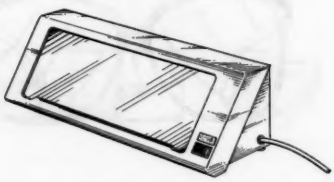
280,515
HEAD FOR SEALING TUBING
Stephen C. Minney, and Daniel C. Harmony, both of Tucson, Ariz., assignors to Engineering & Research Associates, Inc., Tucson, Ariz.
Filed Sep. 20, 1982, Ser. No. 420,493
Term of patent 14 years
U.S. Cl. D15—146



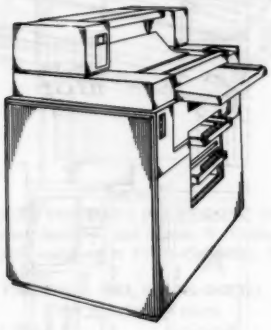
280,516
SHOE REPAIR APPARATUS
Donald W. Phillips, Chateau Perigord 1 (45 D), 6, Lacets Saint Leon, Monaco
Filed Feb. 4, 1983, Ser. No. 463,784
Term of patent 14 years
U.S. Cl. D15—199



280,517
TRANSPARENCY VIEWER
James D. Alsup, Jr., Conyers, Ga., and Randall N. Bartlett, Bay Minette, Ala., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Jul. 18, 1983, Ser. No. 515,002
Term of patent 14 years
U.S. Cl. D16—14



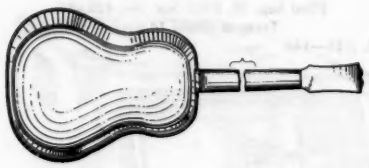
280,518
DUAL MODE DOCUMENT COPIER
Harry F. Elland, Cerritos, and Glen S. Keith, Cardiff By the Sea, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Jul. 14, 1983, Ser. No. 513,936
Term of patent 14 years
U.S. Cl. D16—30



280,519
PAIR OF SPECTACLES OR THE LIKE
Trudy H. Zancaner, Treviso, Italy, assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Mar. 14, 1983, Ser. No. 474,944
Term of patent 14 years
U.S. Cl. D16—102

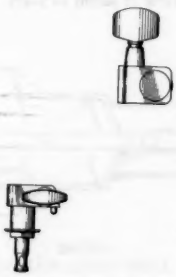
280,520
GUITAR
William H. Edwards, 8890 56th St., Temple Terrace, Fla. 33617
Filed Apr. 19, 1983, Ser. No. 486,559
Term of patent 14 years
U.S. Cl. D17—18

280,521
GUITAR OR SIMILAR ARTICLE
Abraham J. Wechter, 34654 32nd St., Paw Paw, Mich. 49079
Filed Jun. 23, 1983, Ser. No. 507,305
Term of patent 14 years
U.S. Cl. D17—19

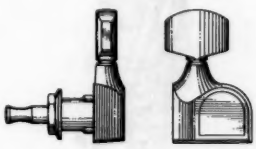


280,522
STRING TREE FOR GUITARS
John F. Page, La Mirada, Calif., assignor to Fender Musical Instruments Corporation, Fullerton, Calif.
Filed May 6, 1983, Ser. No. 492,346
Term of patent 14 years
U.S. Cl. D17—20

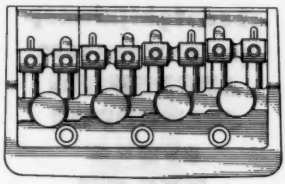
280,523
TUNING MACHINE FOR GUITAR
Daniel J. Smith, La Habra, Calif., assignor to Fender Musical Instruments Corporation, Fullerton, Calif.
Filed May 6, 1983, Ser. No. 492,347
Term of patent 14 years
U.S. Cl. D17—20



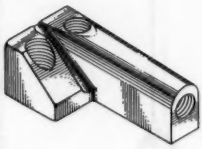
280,524
TUNING MACHINE FOR GUITAR
Daniel J. Smith, La Habra, Calif., assignor to Fender Musical Instruments Corporation, Fullerton, Calif.
Filed May 6, 1983, Ser. No. 492,348
Term of patent 14 years
U.S. Cl. D17—20



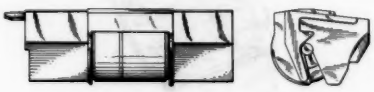
280,525
BRIDGE ASSEMBLY FOR GUITARS
Charles A. Gressett, Jr., Brea, Calif., assignor to Fender Musical Instruments Corporation, Fullerton, Calif.
Filed May 6, 1983, Ser. No. 492,343
Term of patent 14 years
U.S. Cl. D17—21



280,526
BRIDGE SADDLE FOR GUITARS
Charles A. Gressett, Jr., Brea; Charles H. Todd, III, La Habra, and John F. Page, La Mirada, all of Calif., assignors to Fender Musical Instruments Corporation, Fullerton, Calif.
Filed May 6, 1983, Ser. No. 492,344
Term of patent 14 years
U.S. Cl. D17—21

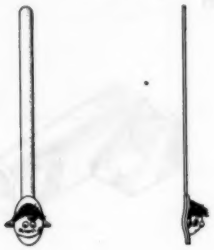


280,527
INK ROLLER SET
Masahiko Mori, Shiojiri, Japan, assignor to Epson Corporation, Suwa, Japan
Filed Jan. 27, 1983, Ser. No. 461,418
Claims priority, application Japan, Jul. 28, 1982, 34092
Term of patent 14 years
U.S. Cl. D18—22



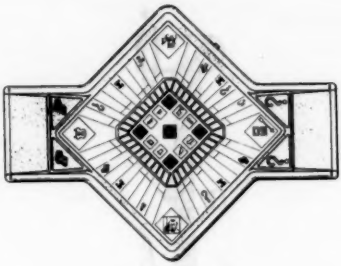
280,528
FONT OF ALPHANUMERIC CHARACTERS
Saul Bass, Los Angeles, Calif., assignor to Allied Corporation, Morris Township, Morris County, N.J.
Filed Apr. 21, 1983, Ser. No. 487,339
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, URA-TY 10/82; Dec. 7, 1982, TY-MR12
Term of patent 14 years
U.S. Cl. D18—24

280,529
BOOK MARKER
Pauline E. Cox, Rte. 1, Box 3, Milton-Freewater, Oreg. 97862
Filed Apr. 16, 1982, Ser. No. 369,177
Term of patent 14 years
U.S. Cl. D19—34

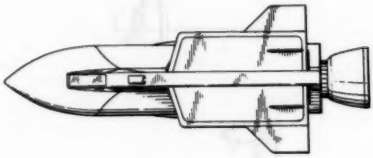


280,530
ELECTRONIC STUDYING MACHINE
Masako Sugiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 22, 1983, Ser. No. 468,124
Claims priority, application Japan, Sep. 1, 1982, 57-39924
Term of patent 14 years
U.S. Cl. D19—60

280,531
ELECTRONIC GAME CASING
Per Hoel, Gloucester, and Kathleen Holland, Wakefield, both of Mass., assignors to CPG Products Corp., Minneapolis, Minn.
Filed Feb. 3, 1983, Ser. No. 463,515
Term of patent 14 years
U.S. Cl. D21—13



280,532
TOY SPACECRAFT
Steven W. Begg, Maidenhead, England, assignor to Anderson Burr Pictures Limited, London, England
Filed Jul. 18, 1983, Ser. No. 514,462
Claims priority, application United Kingdom, Jan. 24, 1983, 1010985
Term of patent 14 years
U.S. Cl. D21—87



280,533
TOY CONSTRUCTION PIECE
Niels M. Pedersen, Billund, Denmark, assignor to Interlego A.G., Switzerland
Filed Dec. 10, 1982, Ser. No. 448,778
Term of patent 14 years
U.S. Cl. D21—108

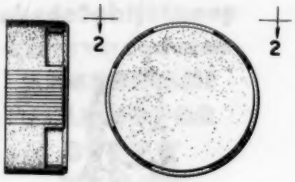
280,534
TOY DOLL
Michael J. Cassaro, 130 Farm St., Wakefield, Mass. 01880
Filed Jun. 8, 1983, Ser. No. 502,091
Term of patent 14 years
U.S. Cl. D21—168

280,535
INDIAN CHIEF DOLL
Ann Carlson, Maple Lake, Minn., assignor to Carlson Dolls Co., Maple Lake, Minn.
Filed Apr. 8, 1983, Ser. No. 483,272
Term of patent 14 years
U.S. Cl. D21—182

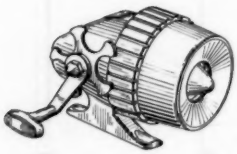
280,536
INDIAN PRINCESS DOLL
Ann Carlson, Maple Lake, Minn., assignor to Carlson Dolls Co., Maple Lake, Minn.
Filed Apr. 8, 1983, Ser. No. 483,273
Term of patent 14 years
U.S. Cl. D21—182

280,537
TILTING HEALTH EXERCISER
Denny B. Law, San Marcos, Calif., assignor to Unique Functional Products, San Marcos, Calif.
Filed Oct. 17, 1983, Ser. No. 543,396
Term of patent 14 years
U.S. Cl. D21—191

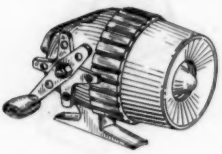
280,538
VAPORIZER FOR INSECTICIDES AND RODENTICIDES
Paul S. Von Till, Colonia, N.J., assignor to American Home Products Corporation, New York, N.Y.
Filed Jan. 3, 1983, Ser. No. 455,373
Term of patent 14 years
U.S. Cl. D22—19



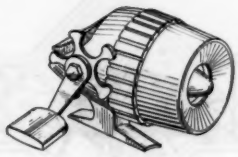
280,539
FISHING REEL
Richard J. Robbins, Derby, Kans.; Robert W. Fee, Ransom Canyon, Tex.; Vernon R. Miller, Tulsa, Okla., and Edwin B. Hatch, West Bend, Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Jun. 22, 1983, Ser. No. 505,472
Term of patent 14 years
U.S. Cl. D22—25



280,540
FISHING REEL
Richard J. Robbins, Derby, Kans.; Robert W. Fee, Ransom Canyon, Tex.; Vernon R. Miller, Tulsa, Okla., and Edwin B. Hatch, West Bend, Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Jun. 22, 1983, Ser. No. 505,473
Term of patent 14 years
U.S. Cl. D22—25

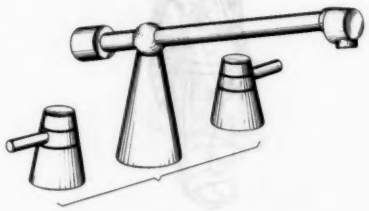


280,541
FISHING REEL
Vernon R. Miller, Tulsa, Okla., and Edwin B. Hatch, West Bend, Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Jun. 22, 1983, Ser. No. 505,474
Term of patent 14 years
U.S. Cl. D22—25

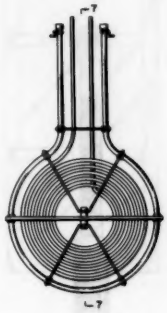


280,542
RETRIEVER FOR HOOKS AND LURES
Robert F. Hurst, P.O. Box 366, Panama City, Fla. 32401
Filed Feb. 10, 1983, Ser. No. 465,452
Term of patent 14 years
U.S. Cl. D22—31

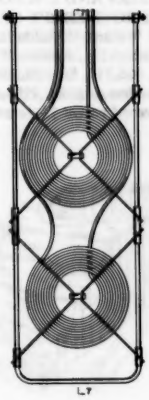
280,543
FAUCET SET
Richard J. Paul, Los Angeles, Calif., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Dec. 28, 1983, Ser. No. 566,250
Term of patent 14 years
U.S. Cl. D23—25



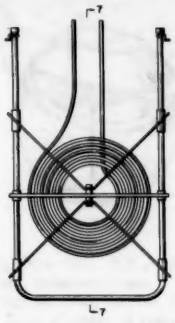
280,544
HEAT EXCHANGER
Masafumi Fukumoto, Amagasaki, Japan, assignor to Nisshin Chemical Industry Co., Ltd., Amagasaki, Japan
Filed Jul. 29, 1982, Ser. No. 403,179
Term of patent 14 years
U.S. Cl. D23—136



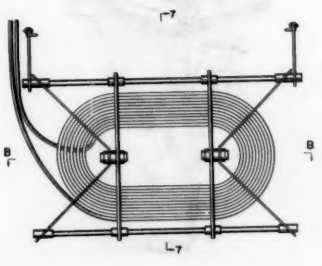
280,545
HEAT EXCHANGER
Masafumi Fukumoto, Amagasaki, Japan, assignor to Nisshin Chemical Industry Co., Ltd., Amagasaki, Japan
Filed Jul. 29, 1982, Ser. No. 403,180
Term of patent 14 years
U.S. Cl. D23—136



280,546
HEAT EXCHANGER
Masafumi Fukumoto, Amagasaki, Japan, assignor to Nisshin Chemical Industry Co., Ltd., Amagasaki, Japan
Filed Jul. 29, 1982, Ser. No. 403,181
Term of patent 14 years
U.S. Cl. D23—136

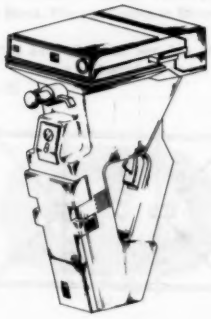


280,547
HEAT EXCHANGER
Masafumi Fukumoto, Amagasaki, Japan, assignor to Nisshin Chemical Industry Co., Ltd., Amagasaki, Japan
Filed Jul. 29, 1982, Ser. No. 403,244
Term of patent 14 years
U.S. Cl. D23—136



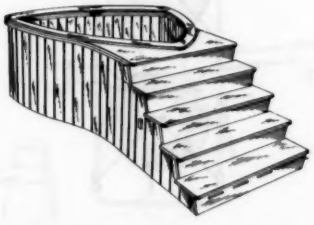
280,548
DISPENSING CONTAINER FOR AIR FRESHENER
Ronald G. Cramer, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Apr. 8, 1983, Ser. No. 483,396
Term of patent 14 years
U.S. Cl. D23—150

280,549
OPHTHALMIC CAMERA
Richard H. Seager, W. Mystic, Conn., assignor to Warner Lambert Technologies, Inc., Tex.
Filed Dec. 20, 1982, Ser. No. 451,352
Term of patent 14 years
U.S. Cl. D24—8

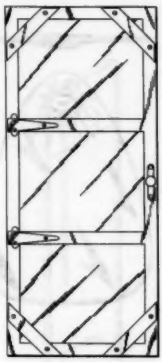


280,550
MEDICAL STAPLE HOLDER
Clyde R. Pratt, Somis, and Roger G. Carignan, Ventura, both of Calif., assignors to Techmedica, Inc., Camarillo, Calif.
Filed Apr. 15, 1982, Ser. No. 368,654
Term of patent 14 years
U.S. Cl. D24—27

280,551
COMBINED STAIRS AND ENCLOSURE FOR A HYDROTHERAPY SPA
Alfred W. Elsner, and Willard H. Schmitz, both of Plymouth, Wis., assignors to Kohler Co., Kohler, Wis.
Division of Ser. No. 426,210, Sep. 28, 1982, Pat. No. Des. 277,409. This application Aug. 20, 1984, Ser. No. 642,485
Term of patent 14 years
U.S. Cl. D24—38



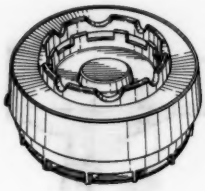
280,552
STORM DOOR
Norma Collins, 4 Elm St., Peabody, Mass. 01960
Filed Feb. 14, 1983, Ser. No. 465,911
Term of patent 14 years
U.S. Cl. D25—48



280,553
CANDLE ARRANGEMENT
Monique Fieschi, and Marie-Jacqueline Galhaud, both of Domaine de Peyroulet, Avenue de L'Europe, 33700 Merignac, France
Filed Apr. 5, 1983, Ser. No. 482,163
Claims priority, application France, Oct. 5, 1982, 823 398
Term of patent 14 years
U.S. Cl. D26—7

280,554
LAMP BASE
Sante G. Alessandro, New York, N.Y., assignor to Erwin Lambeth, Inc., Thomasville, N.C.
Filed Mar. 25, 1983, Ser. No. 479,083
Term of patent 14 years
U.S. Cl. D26—110

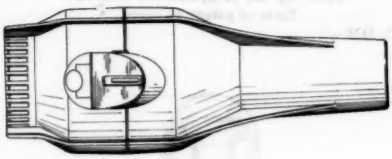
280,555
ASHTRAY
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Aug. 10, 1983, Ser. No. 521,892
Term of patent 14 years
U.S. Cl. D27—27



280,556
TABLET
Eric M. Mittleberg, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 26, 1983, Ser. No. 535,956
Term of patent 14 years
U.S. Cl. D28—3

280,557
TABLET
Douglas C. Becker, Warwick, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 26, 1983, Ser. No. 535,958
Term of patent 14 years
U.S. Cl. D28—3

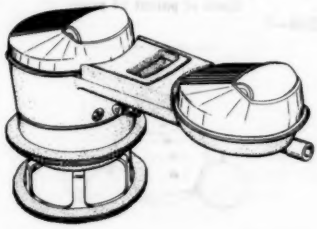
280,558
HAIR DRYER OR SIMILAR ARTICLE
Ralph M. Lazar, Skokie; Kurt T. Peterson, Chicago, and Randall P. Bell, Oak Park, all of Ill., assignors to Helen of Troy Corporation, El Paso, Tex.
Filed Jun. 1, 1984, Ser. No. 616,712
Term of patent 14 years
U.S. Cl. D28—13



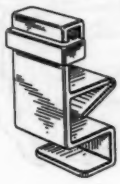
280,559
BIRD FEEDER
Simon W. Bentall, St. Albans, England, assignor to Ambig Products Limited, London, England
Filed Apr. 27, 1983, Ser. No. 489,146
Term of patent 14 years
U.S. Cl. D30—14

280,560
PET BAG OR SIMILAR ARTICLE
Marguerite M. Vitolo, 447 Tenth Ave., New York, N.Y. 10001
Filed Jan. 24, 1983, Ser. No. 441,940
Term of patent 14 years
U.S. Cl. D30—37

280,561
POOL CLEANER
John L. Gard, Mountain View, Calif., assignor to Arneson Products, Inc., Corte Madera, Calif.
Filed Oct. 13, 1982, Ser. No. 434,089
Term of patent 14 years
U.S. Cl. D32—1



280,562
LEG FOR A PAINT TRAY
Morley L. Smith, Beaconsfield, Canada, assignor to T. S. Simms & Co. Limited, Saint John, Canada
Filed Mar. 17, 1983, Ser. No. 476,137
Claims priority, application Canada, Sep. 27, 1982, 27-09-82-5
Term of patent 14 years
U.S. Cl. D32—53.1

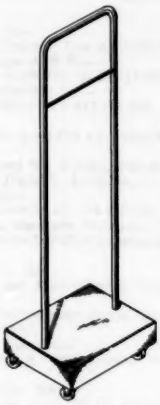


280,563

CHEST DRAINAGE EQUIPMENT SUPPORT CART

Carl W. E. Cobb, Centerville, Ohio, assignor to Kettering Medical Center, Kettering, Ohio

Filed Aug. 5, 1982, Ser. No. 405,694
Term of patent 14 years
U.S. Cl. D34—17

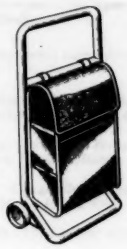


280,564

CARRYING CART WITH DETACHABLE PACK

Michael C. Wilson, Glen Ellyn, Ill., assignor to Tyke Corporation, Chicago, Ill.

Filed Feb. 10, 1983, Ser. No. 465,508
Term of patent 14 years
U.S. Cl. D34—25



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TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF SEPTEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-Lok Products, Inc.: *See—*
Ditcher, Jack; and Ditcher, Eric A., 4,540,310, Cl. 404-25.000.

A.M.C. Maskin Compagni A/S: *See—*
Moeller, Knud A., 4,539,971, Cl. 125-11.00H.

A/S Kongsberg Vapenfabrikk: *See—*
Olsen, Sten O., 4,540,337, Cl. 415-141.000.

AB Volvo: *See—*
Ahlbom, Sten H. N., 4,541,049, Cl. 364-424.000.

Abbott, John H.: *See—*
Thompson, Raymond W.; Kalidas, Navinchandra; Abbott, John H.; and Laffitte, David S., 4,540,226, Cl. 339-17.0CF.

Abbott Laboratories: *See—*
Chu, Daniel T., 4,540,694, Cl. 514-232.000.

Abe, Fumitaka; Kimura, Masatoshi; Watanabe, Toshihiko; and Yamada, Hiroshi, to Fujitsu Limited. Multicolor printing device. 4,540,272, Cl. 355-4.000.

Abou-Gharbia, Magid A.: *See—*
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Abuyama, Yasuo, to Toshiba Corporation. Image forming apparatus. 4,540,274, Cl. 355-14.0FU.

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McCollum, William A.; and Larsen, William, 4,539,842, Cl. 73-168.000.

Acebee Manufacturing Co.: *See—*
Thorschmidt, Donald, 4,540,390, Cl. 493-23.000.

Acitelli, Mario A.; Tynan, Richard F.; and Wayson, Alan R., to International Business Machines Corporation. Article identification material and method and apparatus for using it. 4,540,595, Cl. 427-7.000.

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Lortie, Richard P.; and Adams, William R., 4,540,118, Cl. 236-44.00C.

Adeka Argus Chemical Co., Ltd.: *See—*
Nakahara, Yutaka; and Kimura, Ryoji, 4,540,728, Cl. 524-100.000.

Adria Laboratories, Inc.: *See—*
Carter, John P., Jr.; and Wolgemuth, Richard L., 4,540,814, Cl. 564-172.000.

Advanced Design Corporation: *See—*
Nelson, Edwin A.; and Webb, Ronald C., 4,540,365, Cl. 433-88.000.

Adviesbureau D3BN Civiel Ingenieurs: *See—*
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Wise, Fred W., 4,539,843, Cl. 73-179.000.

Aeroquip Corporation: *See—*
Rogers, Russell L., 4,540,021, Cl. 137-614.050.

Aetna Telecommunications Laboratories: *See—*
Nath, Dilip K., 4,540,601, Cl. 427-163.000.

Afonso, Adriano; and Weinstein, Jay, to Schering Corporation. 2-[(R) Amino acid alkyl]penems. 4,540,579, Cl. 514-195.000.

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Massengeil, Hans A.; Overmeer, Robert; Pietruska, Joachim; and Caufriez, Jean J., 4,540,166, Cl. 271-3.100.

Ahlbom, Sten H. N., to AB Volvo. Method for updating in a wheeled vehicle steered by dead reckoning. 4,541,049, Cl. 364-424.000.

Ahrens, Norbert; Heinemann, Otto; Klockenbusch, Heinrich; and Kluger, Wolfgang, to Krupp Polysius AG. Silo for loose material in powder form. 4,539,782, Cl. 52-192.000.

Aiba, Shigeo: *See—*
Kako, Hiroyoshi; Kobayashi, Nobuo; Tanimoto, Iwao; and Aiba, Shigeo, 4,539,857, Cl. 74-422.000.

Aigner, Karl. Double perfusion catheter. 4,540,402, Cl. 604-44.000.

Aisan Kogyo Kabushiki Kaisha: *See—*
Watanabe, Masaki, 4,540,944, Cl. 328-22.000.

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Gomi, Koichi; and Nishio, Shigeru, 4,540,153, Cl. 251-11.000.
Kawata, Shoji; Hyodo, Hitoshi; and Akita, Tokihiko, 4,540,060, Cl. 180-179.000.
Nishikawa, Masumi, 4,539,861, Cl. 74-493.000.
Tsuchikawa, Shunzo; and Kawabata, Yasuhiro, 4,539,943, Cl. 123-41.050.
Yoneda, Tetsuzo; and Sato, Masanori, 4,539,865, Cl. 74-606.00R.

Aiura, Hirochika: *See—*
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Akihiro, Kazuo: *See—*
Ishikawa, Katsutoshi; Shimotori, Hitoshi; Iida, Noboru; Akihiro, Kazuo; and Ozawa, Shuji, 4,540,698, Cl. 514-270.000.

Akimoto, Ryosaku: *See—*
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Akita, Tokihiko: *See—*
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Akkerman, Neil H., to AVA International Corporation. Flow controlling apparatus. 4,540,047, Cl. 166-188.000.

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Alandale Knitting Company: *See—*
Gutschmit, Alan, 4,540,138, Cl. 242-131.000.

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Albany International Corp.: *See—*
Romanski, Eric R., 4,539,730, Cl. 24-33.00B.

Albouy, Pierre; Salahun, Yves; Botquin, Francois; and Cordani, Roberto, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Electronic subscriber junctor. 4,540,852, Cl. 179-18.0FA.

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York, Billie M., Jr., 4,540,700, Cl. 514-278.000.

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Alfa Romeo Auto S.p.A.: *See—*
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Allen, J. Dewayne, 4,540,312, Cl. 404-110.000.

Allen, Ernest R. Adjustable door jamb anchor. 4,539,784, Cl. 52-217.000.

Allen, George C., to El Paso Products Company. Removal of sulfur compounds from pentane. 4,540,842, Cl. 585-823.000.

Allen, J. Dewayne, to Allen Engineering Corporation. Material spreader system with column bypass. 4,540,312, Cl. 404-110.000.

Allfather, Lars P., to Doble Engineering Company. Power converting. 4,541,040, Cl. 363-37.000.

Allied Corporation: *See—*
Bolenbaugh, Daniel L.; and Smith, Roger L., 4,540,069, Cl. 188-218.00A.
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Herten, Joris F. A.; and Devroede, Emile M., 4,540,736, Cl. 524-556.000.
Mackiewicz, John E.; and Martinic, Jack, 4,539,892, Cl. 91-391.00R.
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Taig, Alistair G., 4,540,383, Cl. 464-110.000.
Thomas, Rudy V., 4,540,218, Cl. 297-467.000.
Van Der Puy, Michael; Hendrickson, Larry L.; Kolc, Jaroslav F.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,540,428, Cl. 71-28.000.
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Bishop, Charles D.; Stamps, Kenneth H.; and Turney, David L., 4,539,898, Cl. 99-336.000.

Alpert, Sidney A. Football signaling system. 4,541,013, Cl. 358-142.000.

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Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; and Pfeiffer, Richard, to Transformatoren Union Aktiengesellschaft. Method of manufacturing transformer windings embedded in casting resin. 4,540,536, Cl. 264-102.000.

Altmann, Micha: *See*—
Givol, Benny, 4,539,829, Cl. 70-454.000.

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Kutcher, Howard R., 4,540,101, Cl. 215-252.000.
Smith, William R., 4,539,725, Cl. 15-93.00A.
van Linden, Jan H. L.; and Whitehead, James S., 4,540,163, Cl. 266-201.000.
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Amana Refrigeration, Inc.: *See*—
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Ambrose, Ronald R.; Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., to PPG Industries, Inc. High solids polyester polyols and resinous polyols thereof. 4,540,771, Cl. 528-272.000.

Ambrose, Ronald R.: *See*—
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Amchem Products, Inc.: *See*—
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Ament, Frank: *See*—
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Amer, Nabil M., to United States of America, Energy. Photothermal method of determining calorific properties of coal. 4,540,285, Cl. 356-432.000.

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Frazier, Charles, 4,540,505, Cl. 252-106.000.
Murdock, Keith C.; and Durr, Frederick E., 4,540,519, Cl. 260-380.000.
Murdock, Keith C.; and Durr, Frederick E., 4,540,583, Cl. 514-656.000.
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American Home Products' Corporation: *See*—
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American Hospital Supply Corporation: *See*—
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Pike, Kelly, 4,539,849, Cl. 73-715.000.
Roman, Daniel P., Jr.; and Fruitstone, Mitchell J., 4,540,565, Cl. 424-11.000.

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American Tech. Manufacturing, Inc.: *See*—
Linker, Frank V.; and Linker, Frank V., Jr., 4,539,878, Cl. 83-99.000.

Amity Leather Products Co.: *See*—
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Amoco Corporation: *See*—
Arzoumanidis, Gregory G.; and Lee, Sam S., 4,540,679, Cl. 502-111.000.

Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; van der Maas, Hendrikus; and Suerken, Hans-Peter, to Dynamit Nobel AG. Method for the modification of starch in an aqueous medium. 4,540,777, Cl. 536-102.000.

AMP: *See*—
Forney, Edgar W., Jr., 4,540,231, Cl. 339-94.00C.

Ampex Corporation: *See*—
Ryan, John O., 4,540,919, Cl. 315-384.000.

Amphoux, Andre ; and Carbon, Jean M. Articulated tubular conduit arm for sucking gaseous fluids. 4,540,202, Cl. 285-184.000.

Ancra Corporation: *See*—
Nordstrom, Arnold B., 4,540,080, Cl. 193-40.000.

Andersen, Kjeld J.: *See*—
Pedersen, Karsten; Rostrup-Nielsen, Jens R.; Jorgensen, Ib Greve H.; and Andersen, Kjeld J., 4,540,714, Cl. 518-714.000.

Anderson, Arnold N.: *See*—
Mautner, Jacob E.; Crennan, Gerard; and Anderson, Arnold N., 4,539,727, Cl. 16-285.000.

Anderson, James L.; and Brewster, Jeffrey D., to University of Georgia Research Foundation, Inc. Fiber optic thin-layer cell. 4,540,280, Cl. 356-246.000.

Andersson, Arvo E.: *See*—
Jarvinen, Erkki J.; Taskinen, Pekka M.; Pullo, Jarmo J.; Kinnunen, Seppo T.; and Andersson, Arvo E., 4,540,290, Cl. 366-286.000.

Ando, Masao: *See*—
Senda, Kenichi; Ando, Masao; Nakamura, Kyoichi; and Nishida, Tatehiko, 4,540,718, Cl. 521-58.000.

Ando, Takao: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,540,689, Cl. 514-196.000.

Andow, Fumio; Yamaura, Mitsuru; and Kondow, Ryotaro, to Tokyo Shibaura Denki Kabushiki Kaisha. Protective relay system. 4,541,058, Cl. 364-483.000.

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Musin, Rafail M.; Gryaznov, Mikhail I.; Timofeev, Dmitry A.; Filatov, Nikolai Y.; and Andreeva, Tamara S., 4,541,070, Cl. 364-900.000.

Andres, Uri. Method and apparatus for crushing materials such as minerals. 4,540,127, Cl. 241-1.000.

Andrew Corporation: *See*—
Saad, Saad S., 4,540,959, Cl. 333-21.00R.

Android Corporation: *See*—
Masserang, Gregory J., 4,540,211, Cl. 294-88.000.

Angell, Cyril E. N., to Avon Industrial Polymers Limited. Respirator speech transmitter. 4,539,983, Cl. 128-201.190.

Angmorter, Paul K.: *See*—
Simpson, Howard D.; Richardson, Ryden L.; and Angmorter, Paul K., 4,540,483, Cl. 208-216.0PP.

Anicon, Inc.: *See*—
Campbell, Bryant A.; DuBois, Dale R.; Manriquez, Ralph F.; and Miller, Nicholas E., 4,539,933, Cl. 118-719.000.

Anthony, Philip J.; Hartman, Robert L.; Koszi, Louis A.; and Schwartz, Bertram, to AT&T Bell Laboratories. Production of semiconductor structures with buried resistive or conductive regions by controlled ion bombardment and heat treatment. 4,539,743, Cl. 29-576.00B.

Antol, Ronald F.; Kalkbrenner, Ralph W.; and Kobuck, Richard M., to Westinghouse Electric Corp. Strap and vane positioning fixture for fuel rod grid and method. 4,539,738, Cl. 29-467.000.

Antony, Gabriel; and Frost, Richard B., to Unisearch Limited. Auxological measuring apparatus. 4,539,754, Cl. 33-169.00R.

Aoki, Eiichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of waveshape memory type with expression control. 4,539,884, Cl. 84-1.240.

Aoki, Masahiro: *See*—
Hayashi, Asao; Aoki, Masahiro; Oinoue, Kenichi; and Ida, Masatoshi, 4,540,881, Cl. 250-201.000.

Apel, Thomas R., to Rockwell International Corporation. Singly terminated distributed amplifier. 4,540,954, Cl. 330-286.000.

Appel, Eggert; Geisler, Gottfried; and Kiene, Wilfried, to Fischer & Porter Company. Magnetic flowmeter. 4,539,853, Cl. 73-861.120.

Appleton Papers Inc.: *See*—
Bodmer, Jerome R.; and Miller, Robert E., 4,540,998, Cl. 346-212.000.

Applied Immune Sciences, Inc.: *See*—
Marten, James F., 4,540,401, Cl. 604-28.000.

Aqua-Aerobic Systems, Inc.: *See*—
Johnson, John K.; Earhart, Jack R.; Astrom, Gordon L.; and Herbig, Mark A., 4,540,487, Cl. 210-264.000.

Arad, Abraham: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham, 4,540,380, Cl. 446-463.000.

Arai, Fuminori; and Kitajima, Masao, to Fuji Photo Film Co., Ltd. Method for measurement of liquid samples. 4,540,670, Cl. 436-170.000.

Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Shift mechanism in a manual transmission. 4,539,859, Cl. 74-475.000.

Arai, Naoto, to Kanzaki Paper Manufacturing Co., Ltd. Heat-sensitive record material. 4,540,999, Cl. 346-216.000.

Arai, Takao: *See*—
Nishida, Masami; Nishimura, Keizo; Arai, Takao; and Amada, Nobutaka, 4,541,091, Cl. 371-39.000.

Arai, Tetsuji; and Igarashi, Tatsuhi, to Ushio Denki Kabushiki Kaisha. Halogen lamp unit. 4,540,911, Cl. 313-44.000.

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Azuma, Noriharu; and Suetomo, Shigeru, 4,540,480, Cl. 208-44.000.

Arcair Company: *See*—
Johnson, David E.; and McCall, Kenneth E., 4,540,225, Cl. 339-16.0RC.

Argoudelis, Alexander D.: *See*—
Hannon, Betty R.; Reusser, Fritz; Dolak, Lester A.; Argoudelis, Alexander D.; and Castle, Thomas M., 4,540,661, Cl. 435-42.000.

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Armstrong, Donald J.: *See*—
Hengel, James F.; Armstrong, Donald J.; Ament, Frank; Center, Marc B.; and Ausen, John E., 4,539,956, Cl. 123-357.000.

Arndt, Otto; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of 6-chloro-2,4-dinitrophenol. 4,540,832, Cl. 568-711.000.

Arnold, Eugene E., to Flow Systems, Inc. Self generating profile generator. 4,540,320, Cl. 409-232.000.

Arnold, Fred E.: *See—*
Wallace, J. Shield; and Arnold, Fred E., 4,540,833, Cl. 568-766.000.
Arthur D. Little, Inc.: *See—*
Teagan, William P., 4,539,975, Cl. 126-439.000.
Arzoumanidis, Gregory G.; and Lee, Sam S., to Amoco Corporation. Magnesium hydrocarbyl carbonate supports. 4,540,679, Cl. 502-111.000.
Asada, Toshihiko: *See—*
Ochi, Akira; and Asada, Toshihiko, 4,540,063, Cl. 181-135.000.
Asahi Glass Company, Ltd.: *See—*
Takahashi, Kunio; Oda, Noriyuki; Kido, Nobuyuki; and Muramatsu, Keizi, 4,540,184, Cl. 277-12.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ukai, Norio; and Tomizuka, Katsushige, 4,539,805, Cl. 57-290.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Hoshika, Shuji; Ishiai, Hideyuki; Nishikawa, Yukiyasu; Hara, Masato; Aiura, Hirochika; Okamoto, Ikuzo; and Shindow, Osamu, 4,540,253, Cl. 351-211.000.
Asahi Yukizai Kogyo Co., Ltd.: *See—*
Kawanami, Isao, 4,540,157, Cl. 251-315.000.
Asai, Tadamichi: *See—*
Takeda, Yukio; Ogihara, Satoru; Ura, Mitsuru; Nakamura, Kousuke; Asai, Tadamichi; Ohkoshi, Tokio; Matsushita, Yasuo; and Maeda, Kunihiro, 4,540,673, Cl. 501-96.000.
Asakawa, Kenichi: *See—*
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,540,942, Cl. 324-326.000.
Asars, Juris A., to Westinghouse Electric Corp. Electronic circuitry with self-calibrating feedback for use with an optical current sensor. 4,540,937, Cl. 324-96.000.
Asea AB: *See—*
Beijar, Ole; and Mattsson, Mats, 4,540,848, Cl. 174-152.00R.
ASEA Aktiebolag: *See—*
Rappinger, Bo; and Stenkvist, Sven-Einar, 4,541,099, Cl. 373-72.000.
Ashbeck, Robert M., to Davis, Martin I.; and Dewing, Kenneth M. Sealing closure for a flexible container. 4,541,117, Cl. 383-64.000.
Ashland Oil Inc.: *See—*
Dunnavant, William R.; Gardikes, John J.; and Langer, Heimo J., 4,540,724, Cl. 523-143.000.
Goel, Anil B.; and Tufts, Timothy A., 4,540,767, Cl. 528-60.000.
Moy, Timothy Y., 4,540,531, Cl. 261-141.000.
Ashlock, Lysander T.; Mukamal, Harold; and White, William H., to Swedlow, Inc. Articles coated with transparent, abrasion resistant compositions. 4,540,634, Cl. 428-451.000.
Astrom, Gordon L.: *See—*
Johnson, John K.; Earhart, Jack R.; Astrom, Gordon L.; and Herbig, Mark A., 4,540,487, Cl. 210-264.000.
AT&T Bell Laboratories: *See—*
Anthony, Philip J.; Hartman, Robert L.; Koszi, Louis A.; and Schwartz, Bertram, 4,539,743, Cl. 29-576.00B.
Boredelon, Chester M.; Chin, Gilbert Y.; Jin, Sungho; Sherwood, Richard C.; and Wernick, Jack H., 4,540,453, Cl. 148-31.550.
Dumbri, Austin C.; and Procyk, Frank J., 4,541,078, Cl. 365-230.000.
Dyer, Christopher K., 4,540,476, Cl. 204-96.000.
Herr, Diane E.; Suk, Laddie E.; and Winchell, David F., 4,540,850, Cl. 179-2.0DP.
Madden, James J., 4,540,229, Cl. 339-75.00M.
Matthews, Paul G., 4,541,056, Cl. 364-300.000.
Ross, David G., 4,540,950, Cl. 330-267.000.
Smith, Arnold R., 4,540,846, Cl. 174-38.000.
Williams, Gareth F., 4,540,952, Cl. 330-279.000.
AT&T Technologies: *See—*
Boredelon, Chester M.; Chin, Gilbert Y.; Jin, Sungho; Sherwood, Richard C.; and Wernick, Jack H., 4,540,453, Cl. 148-31.550.
AT&T Technologies, Inc.: *See—*
Brown, Robert J.; Fernandez, Douglas R.; and McGonigal, Charles, 4,539,748, Cl. 29-874.000.
Fanning, William J., 4,541,034, Cl. 361-405.000.
Kent, William C., 4,540,030, Cl. 140-93.00R.
Weaver, Frederick R., Jr., 4,539,776, Cl. 51-156.000.
Atkins, Terrance J.; Field, Martin J.; and Lamirande, Donald J., to General Motors Corporation. Fuel rail. 4,539,961, Cl. 123-468.000.
Atlas, Dan. Electrical measuring system particularly useful for the non-invasive examination of biological tissue. 4,540,002, Cl. 128-734.000.
Aufderhaar, Ernst, to Ciba-Geigy Corporation. 5-Cyano- and 5-carbamoyl-10-nitro-5H-dibenz[b,f]azepine. 4,540,514, Cl. 260-239.00D.
Ausen, John E.: *See—*
Hengel, James F.; Armstrong, Donald J.; Ament, Frank; Center, Marc B.; and Ausen, John E., 4,539,956, Cl. 123-357.000.
Autoflug GmbH: *See—*
Werkes, Heinz; and Nohren, Hubert, 4,540,987, Cl. 343-18.00B.
Automated Swimpools, Inc.: *See—*
Schuster, Siegfried; and Boes, Christian, 4,539,719, Cl. 4-491.000.
Automatic Liquid Packaging, Inc.: *See—*
Weiler, Gerhard H., 4,540,542, Cl. 264-524.000.
Automeg, Inc.: *See—*
Horvath, Joseph G.; and Miller, James C., 4,540,922, Cl. 318-490.000.
AVA International Corporation: *See—*
Akkerman, Neil H., 4,540,047, Cl. 166-188.000.
Avar, Geza: *See—*
Haas, Peter; Avar, Geza; and Grammes, Hartwig, 4,540,626, Cl. 428-318.800.
Avery, John: *See—*
Blomquist, Leonard A.; and Avery, John, 4,540,460, Cl. 156-571.000.
AVI Alpenlandische Veredelungs-Industrie Gesellschaft m.b.H.: *See—*
Ritter, Gerhard; and Ritter, Klaus, 4,539,787, Cl. 52-664.000.
Avon Industrial Polymers Limited: *See—*
Angell, Cyril E. N., 4,539,983, Cl. 128-201.190.
AVX Corporation: *See—*
Scrantom, DeHart G.; and Shealey, E. David, 4,539,740, Cl. 29-564.100.
AWA Engineering Co., Ltd.: *See—*
Kubo, Yoshiharu, 4,540,132, Cl. 242-67.10R.
Azrack-Hamway International, Inc.: *See—*
Turbowitz, Leslie; and Pipa, William, 4,540,376, Cl. 446-164.000.
Azuma, Noriharu; and Suetomo, Shigeru, to Arakawa Kagaku Kogyo Kabushiki Kaisha. Process for preparing hydrogenated petroleum resin. 4,540,480, Cl. 208-44.000.
Azzaroni, Cesare. Automatic machine for unloading and reloading films from and into X ray cassettes. 4,539,794, Cl. 53-493.000.
B. D. Wait Co. Limited: *See—*
Wignall, Robert A.; and Travale, Samuel, 4,540,530, Cl. 261-92.000.
B. F. Goodrich Company, The: *See—*
Doljack, Frank A., 4,541,063, Cl. 364-550.000.
Okamoto, Yoshihisa, 4,540,742, Cl. 525-61.000.
B/K Patent Development Company, Inc.: *See—*
Schwab, Pierre P., 4,541,032, Cl. 361-331.000.
Baba, Seizo: *See—*
Kato, Heiji; Kizaki, Kanji; and Baba, Seizo, 4,539,833, Cl. 72-243.000.
Babcock & Wilcox Company, The: *See—*
Klatt, John H.; and Scheib, Thomas J., 4,539,840, Cl. 73-112.000.
Zadiraka, Allan J., 4,540,129, Cl. 241-34.000.
Bacardit, Juan S., to Bendiberica, S.A. Rotating hydraulic distributor and method of manufacturing chamfered closing edges of a rotating member of such a distributor. 4,540,024, Cl. 137-625.210.
Bachalo, William D. Apparatus and method for determining the size and velocity of particles, droplets, bubbles or the like using laser light scattering. 4,540,283, Cl. 356-336.000.
Backlund, Lennart, to Forenade Fabriksverken. Arrangement for tubular heat exchangers located in a lake. 4,540,041, Cl. 165-45.000.
Bademian, Leon, to Isomet Corporation. Apparatus and method for acousto-optic character generation. 4,540,245, Cl. 350-358.000.
Badiali, Roberto: *See—*
Bertoli, Luciano; Badiali, Roberto; and Speranzin, Claudio, 4,539,802, Cl. 57-22.000.
Baer, Ralph H., to Sanders Associates, Inc. Microprocessor interface device. 4,540,176, Cl. 273-148.00B.
Bailey, Denis M., to Sterling Drug Inc. Antidepressant imidazolines and related compounds. 4,540,705, Cl. 514-401.000.
Bailly, Richard L. Odor absorbing wrap. 4,539,982, Cl. 128-156.000.
Baker International Corporation: *See—*
Schmuck, Phillip W.; Salerni, John V.; and Wetzel, Rodney J., 4,540,051, Cl. 166-278.000.
Baker, Ross G., Jr.: *See—*
Calfee, Richard V.; Bertasz, Robert N.; Terry, Reese S., Jr.; Gordon, Pat L.; and Baker, Ross G., Jr., 4,539,992, Cl. 128-419.0PG.
Balax, Inc.: *See—*
Koller, Joseph A., 4,539,832, Cl. 72-118.000.
Ball, Lawrence E.: *See—*
Wu, Muyen M.; and Ball, Lawrence E., 4,540,498, Cl. 252-8.55D.
Ballegeer, Jean C.; and Nguyen, Duyet H., to Thomson-CSF. Resource granting process and device in a system comprising autonomous data processing units. 4,541,043, Cl. 364-200.000.
Balthazor, Terry M.: *See—*
Chupp, John P.; and Balthazor, Terry M., 4,540,522, Cl. 260-465.00E.
Baltimore Aircoil Company, Inc.: *See—*
Geary, David F.; Honchar, Dennis R.; and Miller, Robert P., 4,540,637, Cl. 428-626.000.
Banasiak, Dennis S.; and Byers, Jim D., to Phillips Petroleum Company. Process for preparing olefinic aldehydes. 4,540,826, Cl. 568-420.000.
Banks, Eric W.: *See—*
Roquemore, Glenn R.; Smith, Patrick E.; and Banks, Eric W., 4,540,315, Cl. 405-264.000.
Barber, Alan G., to Union Carbide Corporation. Cooling system cleaning composition. 4,540,443, Cl. 134-2.000.
Barber, Eugene F.; and Barber, Steven C. Self-contained corner radius punch and die machine. 4,539,880, Cl. 83-467.00R.
Barber, Steven C.: *See—*
Barber, Eugene F.; and Barber, Steven C., 4,539,880, Cl. 83-467.00R.
Bard Limited: *See—*
Cross, David E., 4,540,156, Cl. 251-309.000.
Barnaby, Harold T., to Core Laboratories, Inc. Driven-capillary viscosimeter. 4,539,837, Cl. 73-55.000.
Barnard, Royal W. Compact water purifying device. 4,540,489, Cl. 210-287.000.
Barone, John A. Methods for coating acoustical surfaces. 4,540,605, Cl. 427-243.000.
Barsa, Edward A., to Upjohn Company, The. Product and process trimerization of organic isocyanates. 4,540,781, Cl. 544-193.000.
Barson, Craig; and Denny, Thomas, to Johnson & Johnson Products, Inc. Knitted surgical swabs. 4,540,398, Cl. 604-1.000.

Bartfield, William, to Prize Frize, Inc. Apparatus and method for dispensing individual orders of a hot food product and components usable therewith. 4,540,588, Cl. 426-231.000.

Barton, Bruce C.: *See—*
Wormser, Robert S.; and Barton, Bruce C., 4,540,095, Cl. 212-187.000.

BASF Aktiengesellschaft: *See—*
Franke, Albrecht; Muller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Gunther; Muller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,540,697, Cl. 514-255.000.
Mahnke, Harald; Woerner, Frank P.; Weber, Heinz; and Kreibiehl, Guenter, 4,540,717, Cl. 521-52.000.
Pipper, Gunter; Schmidt, Franz; Theysohn, Rainer; Riegger, Siegfried; Heil, Eduard; Fischer, Hermann; Thoma, Richard; and Matthies, Paul, 4,540,772, Cl. 528-335.000.
Schulz, Guenther; and Wallbillich, Guenther, 4,540,743, Cl. 525-61.000.

Basile, Peter A., to Black & Decker, Inc. Mounting arrangement. 4,540,146, Cl. 248-201.000.

Bates Ventilsakke Co. A/S: *See—*
Berthelsen, Ernst R., 4,540,396, Cl. 493-447.000.

Battle, Billy J.; Graham, Robert M.; Jones, Lawrence S.; Malizio, Andrew B.; and Rhodes, George F., to United States Pipe and Foundry Company. Restrained pipe joint. 4,540,204, Cl. 285-231.000.

Bauer, Kurt H. Process for the production of readily soluble 5-aminosalicylic acid preparations, compositions and methods of use. 4,540,685, Cl. 514-162.000.

Baugh, Benton F.; Henderson, Herman O., Jr.; and Fowler, John H., to Smith International, Inc. Breech block hanger support well completion method. 4,540,053, Cl. 166-348.000.

Baughman, Richard C.; Bump, David S.; and Hubbard, Charles R., to Eastman Kodak Company. Adhesive binding method for seriatim fed sheets. 4,540,458, Cl. 156-312.000.

Baumbach, Per L.; and Poulsen, Jorgen, to Radiometer A/S. Method for transcutaneous measurement of a blood parameter and an electrochemical measuring electrode device for carrying out the method. 4,539,994, Cl. 128-635.000.

Baumberg, Iosif. Hydraulic memory device. 4,540,014, Cl. 137-123.000.

Baumgartner, Steven A.: *See—*
Campbell, Clarence R.; Mickelson, Elliot S.; and Baumgartner, Steven A., 4,540,357, Cl. 425-23.00B.

Baxter, Gregory R.: *See—*
Southworth, Peter R.; and Baxter, Gregory R., 4,540,326, Cl. 414-217.000.

Baxter Travenol Laboratories, Inc.: *See—*
Olson, Raymond G., 4,540,351, Cl. 417-476.000.

Bayer AG: *See—*
Haas, Peter; Avar, Geza; and Grammes, Hartwig, 4,540,626, Cl. 428-318.800.

Bayer Aktiengesellschaft: *See—*
Beecken, Hermann, 4,540,523, Cl. 260-465.00D.
Behre, Horst; Blank, Heinz U.; Seyberlich, Alfred; and Hagedorn, Ferdinand, 4,540,817, Cl. 564-218.000.
Forster, Heinz; Diehr, Hans-Joachim; Stetter, Jorg; Eue, Ludwig; and Schmidt, Robert R., 4,540,430, Cl. 71-90.000.
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert, 4,540,827, Cl. 568-442.000.
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,540,789, Cl. 546-274.000.
Henk, Hermann; Kramer, Erich; Schundehutte, Karl H.; and Nickel, Horst, 4,540,776, Cl. 534-635.000.
Koemm, Ulrich; and Geisler, Klaus, 4,540,765, Cl. 528-45.000.
Mardin, Mithat; Busse, Wolf-Dieter; Hoffmeister, Friedrich; Seuter, Friedel; Perzborn, Elisabeth; Schlossmann, Klaus; Mayer, Dieter; and Fiedler, Volker, 4,540,707, Cl. 514-404.000.
Rasshofer, Werner; Grogler, Gerhard; Konig, Klaus; and Dieterich, Dieter, 4,540,720, Cl. 521-159.000.
Stoltefuss, Jurgen; Franckowiak, Gerhard; Boshagen, Horst; Goldmann, Siegfried; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,540,684, Cl. 514-32.000.

Beach, Ronald I.: *See—*
Hardman, Harley F.; and Beach, Ronald I., 4,540,713, Cl. 518-713.000.

Beatrice Foods, Co.: *See—*
Hipko, George P., 4,540,880, Cl. 235-487.000.

Becker, Erich. Pendular piston pump having a cup-shaped sealing element. 4,540,352, Cl. 417-571.000.

Beckman Instruments, Inc.: *See—*
Henriksen, Melvin S.; and Meyer, Richard C., 4,540,015, Cl. 137-240.000.

Beckman, John H.: *See—*
Nicholson, Myron D.; and Beckman, John H., 4,540,613, Cl. 428-36.000.

Beecham Group p.l.c.: *See—*
Driver, Michael J., 4,540,688, Cl. 514-196.000.

Beecken, Hermann, to Bayer Aktiengesellschaft. Phenylalkylamino-styryl phenylsulfones. 4,540,523, Cl. 260-465.00D.

Beer, Janos M.; Dilmore, James A.; Vermes, Geza; and Young, William E., to Westinghouse Electric Corp. Multiannular swirl combustor providing particulate separation. 4,539,918, Cl. 110-266.000.

Beery, John C.; and Witzke, Kenneth, to E.S.P. Systems, Inc. Automatic sheet transport mechanism. 4,539,752, Cl. 33-18.00B.

Behre, Horst; Blank, Heinz U.; Seyberlich, Alfred; and Hagedorn, Ferdinand, to Bayer Aktiengesellschaft. Process for the preparation of 5-amino-2,4-dimethylacetanilide. 4,540,817, Cl. 564-218.000.

Beidler, Glenn S., to Pneumo Corporation. Anti-rotation device for contracting rod ring seals. 4,540,186, Cl. 277-195.000.

Beijar, Ole; and Mattsson, Mats, to Asea AB. Electric high-voltage earthquake-resistant bushing. 4,540,848, Cl. 174-152.00R.

Beirne, Patrick R., to Mitel Corporation. Subscriber line interface circuit. 4,540,854, Cl. 179-18.0FA.

Bekesi, Julius G.: *See—*
DeBarbieri, Augusto; and Bekesi, Julius G., 4,540,683, Cl. 514-18.000.

Bekooy, Jan T. Refolding and stacking receptacle for segmented sheet material. 4,540,395, Cl. 493-410.000.

Belanger, Barry F.; and Sieb, Lawrence E., to General Electric Company. Dual energy rapid switching imaging system. 4,541,106, Cl. 378-099.000.

Bell, Cecil R., Jr.; Lathery, Willie M.; Patel, Navin D.; and London, Jasper R., to Consolidated Foods Corporation. Loading system for a toe closing assembly. 4,539,924, Cl. 112-262.200.

Bell, Eugene, to Massachusetts Institute of Technology. Fabrication of living blood vessels and glandular tissues. 4,539,716, Cl. 623-1.000.

Belleville, Marc J. E.: *See—*
Pumo, Joseph; and Belleville, Marc J. E., 4,540,898, Cl. 307-269.000.

Belzile, Jean-Yves. Absorbent swab imbiber. 4,540,366, Cl. 433-136.000.

Ben-Yehuda, Yoel: *See—*
Givol, Benny, 4,539,829, Cl. 70-454.000.

Bendel, Wolfgang: *See—*
Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; and Pfeiffer, Richard, 4,540,536, Cl. 264-102.000.

Bendiberica, S.A.: *See—*
Bacardit, Juan S., 4,540,024, Cl. 137-625.210.

Benjamin, James A.: *See—*
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,541,001, Cl. 357-23.400.

Bennett, Jack L.; Wardynski, Wayne E.; and Seyuin, Kenneth J., to General Motors Corporation. Tripot joint with spider retaining shaft bumper assembly. 4,540,384, Cl. 464-111.000.

Benson S.A.: *See—*
Roche, Michel, 4,540,995, Cl. 346-139.00C.

Bent, John H., deceased; and by Bent, Paul, executor, to Minnesota Mining and Manufacturing Company. Bone stapler. 4,540,110, Cl. 227-8.000.

Bent, Paul, executor: *See—*
Bent, John H., deceased; and Bent, Paul, executor, 4,540,110, Cl. 227-8.000.

Berecz, Imre, to Microdot Inc. Anti-vibration thread form. 4,540,321, Cl. 411-310.000.

Bergh, John C., to Wheelabrator-Frye Inc. Component conveyor apparatus. 4,540,088, Cl. 198-803.150.

Berner, Godwin; and Rutsch, Werner, to Ciba-Geigy Corporation. Process for curing acid-curable finishes. 4,540,598, Cl. 427-54.100.

Berstein, Garri; Hansen, Willi; and Winkens, Rudolf, to Wilhelm Hegenscheidt GmbH. Method for setting the stroke of movable rolling units, and crankshaft rolling machine for implementing said method. 4,539,831, Cl. 72-110.000.

Bertasz, Robert N.: *See—*
Calfee, Richard V.; Bertasz, Robert N.; Terry, Reese S., Jr.; Gordon, Pat L.; and Baker, Ross G., Jr., 4,539,992, Cl. 128-419.0PG.

Berthelsen, Ernst R., to Bates Ventilsakke Co. A/S; and Windmoller & Holscher. Apparatus for folding paper sacks to Z shape. 4,540,396, Cl. 493-447.000.

Bertland, Alexander U.; and Lampson, George P., to Merck & Co., Inc. Herpes simplex type I subunit vaccine. 4,540,669, Cl. 435-235.000.

Bertoli, Luciano; Badiali, Roberto; and Speranzin, Claudio, to Officine Savio S.p.A. Procedure to splice yarns. 4,539,802, Cl. 57-22.000.

Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, to Montedison S.p.A. Method for combatting infestations of insects and acari, and compositions for use in said method. 4,540,711, Cl. 514-720.000.

Bettge, Hans; Bialkowski, Gunther; and Hoene, Ernst-Ludwig, to Siemens Aktiengesellschaft. Vacuum-switching tube, especially for a low-voltage contactor. 4,540,863, Cl. 200-144.00B.

Beu-Tex Corp.: *See—*
Kennedy, William J.; and Beucus, A. John, 4,539,724, Cl. 8-149.100.

Beucus, A. John: *See—*
Kennedy, William J.; and Beucus, A. John, 4,539,724, Cl. 8-149.100.

Bialkowski, Gunther: *See—*
Bettge, Hans; Bialkowski, Gunther; and Hoene, Ernst-Ludwig, 4,540,863, Cl. 200-144.00B.

Biegelmeier, Gottfried, to Brown, Bovery & Cie Aktiengesellschaft. Protective electric house-wiring switch. 4,541,030, Cl. 361-56.000.

Bierlein, John C.: *See—*
Mac Iver, Bernard A.; Erskine, James C., Jr.; and Bierlein, John C., 4,540,636, Cl. 428-610.000.

Biermans, Andreas J.: *See—*
van Nassau, Petrus J. M.; Biermans, Andreas J.; Jonckers, Kees; and de Cooker, Mario G. R. T., 4,540,813, Cl. 564-71.000.

Biggs, Lawrence G.; and Radochonski, Pierre, to Tektronix, Inc. Method and apparatus for avoiding the drying of ink in the ink jets of ink jet printers. 4,540,997, Cl. 346-140.00R.

Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; Gasdik, Charles E.; Light, David N.; and Pickar, Paul B., to International Business Machines Corporation. Copper plating bath having increased plating rate, and method. 4,540,473, Cl. 204-52.00R.

Binkley, Bruce I., to Energy Exchange Systems. Battery recharger. 4,540,929, Cl. 320-2.000.

BIP Chemicals Limited: *See*—
Williams, Richard S., 4,540,729, Cl. 524-114.000.

Bishop, Charles D.; Stamps, Kenneth H.; and Turney, David L., to Alpaire, Inc. Semiautomatic food frying apparatus. 4,539,898, Cl. 99-336.000.

Biziere, Kathleen; Hallot, Andre ; and Kan, Jean-Paul, to Sanofi S.A. 1-Piperazinyl 4-phenylquinazoline compounds having antidepressant properties and drugs containing same. 4,540,696, Cl. 514-254.000.

Bjerkas, Johan B. String instrument of guitar type. 4,539,887, Cl. 84-314.00R.

Black & Decker, Inc.: *See*—
Basile, Peter A., 4,540,146, Cl. 248-201.000.

Blake, Thomas B.: *See*—
Rogers, Lloyd W., Jr.; Pilarski, Regis V.; and Blake, Thomas B., 4,540,137, Cl. 242-107.600.

Blakely, Linda L.; and Seiden, Myron A., to Polaroid Corporation. Identification card camera system and method. 4,540,259, Cl. 354-109.000.

Blank, Heinz U.: *See*—
Behre, Horst; Blank, Heinz U.; Seyberlich, Alfred; and Hagedorn, Ferdinand, 4,540,817, Cl. 564-218.000.

Blaupunkt-Werke GmbH: *See*—
Hopf, Reinhard; and Longchamp, Jean-Francois, 4,541,110, Cl. 381-46.000.

Bleeke, William F., to Xolox Corporation. Magnetic switch apparatus. 4,540,964, Cl. 335-205.000.

Blom, Hans A., to Synektron Corporation. Stator assembly for permanent magnet rotary device. 4,540,906, Cl. 310-67.00R.

Blomquist, Leonard A.; and Avery, John, to Continental Packaging Company, Inc. Slew control mounting device for label magazine. 4,540,460, Cl. 156-571.000.

Bloomer, Milton D., to General Electric Company. Controlled switching of non-regenerative power semiconductors. 4,540,893, Cl. 307-248.000.

Blum, Guy, to Thomson-CSF. Changeover device for selecting one modulator out of two and connecting it into a transmitter. 4,541,121, Cl. 455-103.000.

BOC Group, Inc., The: *See*—
Kurie, John R.; and Stanescu, Mircea S., 4,540,362, Cl. 432-65.000.

Bocelli, Aureliano; and Colombini, Carlo, to Saint-Gobain Vitrage. Apparatus for bending and tempering of thermoplastic sheets of different curvatures. 4,540,425, Cl. 65-273.000.

Bocelli, Aureliano; and Colombini, Carlo, to Saint Gobain Vitrage. Apparatus for bending and tempering thermoplastic sheet material. 4,540,426, Cl. 65-273.000.

Bochman, Harry L., Jr., to Hi-Shear Corporation. Tool for supplying and driving a sequence of threaded fasteners. 4,539,872, Cl. 81-57.370.

Bock, Gustavus P.: *See*—
Wilson, Robert E.; and Bock, Gustavus P., 4,539,955, Cl. 123-339.000.

Boden, Richard M.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,540,812, Cl. 560-256.000.

Bodicky, Raymond O., to Sherwood Medical Company. Catheter placement device. 4,540,411, Cl. 604-169.000.

Bodine Electric Company: *See*—
Marhoefer, Michael, 4,540,928, Cl. 318-696.000.

Bodmer, Jerome R.; and Miller, Robert E., to Appleton Papers Inc. Record member. 4,540,998, Cl. 346-212.000.

Bodor, Nicholas S., to University of Florida. Brain-specific drug delivery. 4,540,564, Cl. 424-9.000.

Boeing Company, The: *See*—
Wang, Timothy; and Zierten, Thomas A., 4,540,143, Cl. 244-130.000.

Boes, Christian: *See*—
Schuster, Siegfried; and Boes, Christian, 4,539,719, Cl. 4-491.000.

Boffer, Jurgen. Board-like floating body. 4,539,926, Cl. 114-39.000.

Bolenbaugh, Daniel L.; and Smith, Roger L., to Allied Corporation. Disc brake assembly and dust shield means therefore. 4,540,069, Cl. 188-218.00A.

Bonazzo, Robert E. Applicator device. 4,540,302, Cl. 401-173.000.

Bond, Gary L.: *See*—
Meyer, Max F., Jr.; Bond, Gary L.; and McConnell, Richard L., 4,540,749, Cl. 525-437.000.

Bongers, Joseph J. M.: *See*—
van Geenen, Albert A.; Bongers, Joseph J. M.; van der Loos, Jozef L. M.; and Vrinssen, Cornelis H., 4,540,515, Cl. 260-239.30R.
van Geenen, Albert A.; Bongers, Joseph J. M.; and van der Loos, Jozef L. M., 4,540,516, Cl. 260-239.30R.

Bonin, Wayne A.; and Dugas, Matthew P., to Vertimag Systems Corporation. Hybrid read-write head for perpendicular recording media. 4,541,026, Cl. 360-121.000.

Bonk, Werner: *See*—
Kerpers, Werner; Bonk, Werner; Roser, Dieter; and Fuhrer, Hans-Jurgen, 4,539,737, Cl. 29-423.000.

Bonsack, James P.; and Fridman, Semyon D., to SCM Corporation. Two stage chlorination of titaniferous ore with $FeCl_3$ reclamation. 4,540,551, Cl. 423-77.000.

Booher, Robert K.: *See*—
Ennis, John J.; and Booher, Robert K., 4,540,904, Cl. 307-473.000.

Bopp, Warren G., to Eaton Corporation. Torque converter viscous bypass coupling with improved seal arrangement. 4,540,076, Cl. 192-58.00B.

Border, Daniel R.: *See*—
Waatti, Kurt J.; and Border, Daniel R., 4,540,715, Cl. 521-26.000.

Boredelon, Chester M.; Chin, Gilbert Y.; Jin, Sungho; Sherwood, Richard C.; and Wernick, Jack H., to AT&T Technologies; and AT&T Bell Laboratories. Magnetically soft ferritic Fe-Cr-Ni alloys. 4,540,453, Cl. 148-31.550.

Borg-Warner Corporation: *See*—
Shaffer, Jacob E., Jr.; and Picarello, Joseph F., 4,540,874, Cl. 219-279.000.

Bornancini, Jose C. M., to Forjas Taurus S.A. Pressable latch for semiautomatic pistol magazines, adaptable for use by left-handed persons. 4,539,770, Cl. 42-7.000.

Borovian, Gayle E., to Lever Brothers Company. Synergistic preservative compositions. 4,540,570, Cl. 424-78.000.

Borovicka, David A., Sr., to SCM Corporation. Method of producing low temperature cure latexes. 4,540,735, Cl. 524-512.000.

Borsenberger, Paul M., to Eastman Kodak Company. Method for the manufacture of photoconductive insulating elements with a broad dynamic exposure range. 4,540,647, Cl. 430-128.000.

Boshagen, Horst: *See*—
Stoltefuss, Jurgen; Franckowiak, Gerhard; Boshagen, Horst; Goldmann, Siegfried; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,540,684, Cl. 514-32.000.

Bosisio, Roberto, to SAME S.p.A. Internal combustion power pack with injection pump ventilation system. 4,539,945, Cl. 123-41.310.

Bossetti, Renato, to S.I.T.I. Societa Impianti Termoelettrici Industriali S.p.A. Supporting structures for furnace crowns. 4,539,919, Cl. 110-331.000.

Bosshard, Werner, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Cartridge infeed apparatus for automatic firing weapons. 4,539,890, Cl. 89-33.200.

Bostian, Bruce R., to Jedco, Inc. Spring biased prop for a pivoted door member. 4,539,726, Cl. 16-72.000.

Botquin, Francois: *See*—
Albouy, Pierre; Salahun, Yves; Botquin, Francois; and Cordani, Roberto, 4,540,852, Cl. 179-18.0FA.

Boudot, Jean E.; Mazeau, Jean P.; and Prassas, Michel, to Corning Glass Works. Glasses of low density and high index of refraction for ophthalmic and optical applications. 4,540,672, Cl. 501-65.000.

Boultinghouse, Harold D., to Phillips Petroleum Company. Treatment of polymer using silver. 4,540,631, Cl. 428-419.000.

Bouron, Francis. Automatic feed device for solid fuel boiler, specifically for logs of wood. 4,539,915, Cl. 110-101.00R.

Boute, Wim; Wittkampf, Frederik H. M.; and van Arragon, Gerrit W., to Vitafin N.V. Dual chamber pacemaker. 4,539,991, Cl. 128-419.0PG.

Bowers, Stephen G.; Trueblood, Tim B.; and Cabiedes, Anthony, to Storage Technology Corporation. Dual port CMOS random access memory. 4,541,076, Cl. 365-190.000.

Bowers, William S., to Cornell Research Foundation, Inc. Anti-juvenile hormones. 4,540,830, Cl. 568-651.000.

Boyd, John H., Jr.; and Muller, Alexander, to General Electric Company. Laundry apparatus and method of controlling such. 4,540,921, Cl. 318-254.000.

Boyle, Richard F.: *See*—
Cooke, Laurence H.; Feretich, Robert A.; and Boyle, Richard F., 4,540,903, Cl. 307-465.000.

Bradshaw, Randolph F.; and Carey, Glen A., to Corning Glass Works. Friction drive for metering device. 4,539,854, Cl. 73-864.180.

Braun Aktiengesellschaft: *See*—
Tittert, Curt, 4,539,974, Cl. 126-409.000.

Braun, Robert L.: *See*—
Mallon, Richard G.; Walton, Otis R.; Lewis, Arthur E.; and Braun, Robert L., 4,539,917, Cl. 110-256.000.

Breeden, John W., to Cuisinarts, Inc. Lock for food pusher in feed tube protector of a food processor. 4,540,128, Cl. 241-37.500.

Bremer Orthopedics, Inc.: *See*—
Bremer, Paul W., 4,539,979, Cl. 128-75.000.

Bremer, Paul W., to Bremer Orthopedics, Inc. Temporary cervical traction maintenance. 4,539,979, Cl. 128-75.000.

Brennfleck, Karl: *See*—
Fitzer, Erich; Brennfleck, Karl; and Schlichting, Jurgen, deceased, 4,540,606, Cl. 427-247.000.

Brevetti Gaggia S.p.A.: *See*—
Pandolfi, Alberto, 4,540,288, Cl. 366-145.000.

Brewer, William D. Method of manufacturing laminated foam plastics materials. 4,540,455, Cl. 156-79.000.

Brewster, Jeffrey D.: *See*—
Anderson, James L.; and Brewster, Jeffrey D., 4,540,280, Cl. 356-246.000.

Brice, Jean-Michel; and Maillart, Patrick, to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux. Non-volatile flip-flop with a static resetting. 4,541,073, Cl. 365-156.000.

Bridges, Charles D., to Gray Tool Company. Temperature sensitive valve bonnet assembly. 4,540,012, Cl. 137-72.000.

Bridgestone Tire Company Limited: *See*—
Ishii, Ryutaro; and Ogawa, Yuichiro, 4,540,131, Cl. 242-55.000.
Oshima, Noboru; Shimizu, Isamu; and Yoshimura, Yoshito, 4,540,744, Cl. 525-332.900.

Briggs, Bruce A., to UOP Inc. Mixed-phase hydrocarbon conversion process employing total overhead condenser. 4,540,831, Cl. 568-697.000.

Brisbane, Roger M.; and Peffley, Thomas R., to General Motors Corporation. Shaft mounted valve position sensor. 4,539,963, Cl. 123-494.000.

Bristol-Myers Company: *See*—
Nair, Xina; and Temple, Davis L., Jr., 4,540,581, Cl. 514-415.000.

British Nuclear Fuels Limited: *See*—
Connolly, Paul A.; and Weston, Barry G., 4,540,488, Cl. 210-268.000.

British Petroleum Company p.l.c., The: *See—*
Reece, Alan R., 4,539,765, Cl. 37-142.500.
Brockwell, Ian P.; and Hancock, Herbert W., to Alfa-Laval Cheese Systems Limited. Cheese block former. 4,539,902, Cl. 99-454.000.
Broome, Kenneth R., to Williams and Broome, Inc. Apparatus for the generation of hydroelectric power and method of manufacturing and installing same. 4,540,313, Cl. 405-78.000.
Brother Kogyo Kabushiki Kaisha: *See—*
Imaizumi, Mamoru; and Kuzuya, Susumu, 4,540,297, Cl. 400-625.000.
Broussard, Alphe. Sofa-bed-dining table combination. 4,539,722, Cl. 5-118.000.
Browall, Kenneth W.: *See—*
Iacovangelo, Charles D.; and Browall, Kenneth W., 4,540,640, Cl. 429-41.000.
Brown, Bernard J.; and Peelle, Thomas B., to Control Gaging, Inc. Machining in-process gage calibration from reference master. 4,539,777, Cl. 51-165.00R.
Brown, Bovery & Cie Aktiengesellschaft: *See—*
Biegelmeier, Gottfried, 4,541,030, Cl. 361-56.000.
Brown, Howard: *See—*
Mallok, Horst; Brown, Howard; and Iacampo, Marco, 4,540,478, Cl. 204-297.00W.
Brown, Robert J.; Fernandez, Douglas R.; and McGonigal, Charles, to AT&T Technologies, Inc. Methods of making an electrical connector. 4,539,748, Cl. 29-874.000.
Brown, Thomas H.; and Rawlings, Derek A., to Smith Kline & French Laboratories Limited. N-Substituted pyridinones having histamine H_2-antagonist activity. 4,540,699, Cl. 514-272.000.
Brown & Williamson Tobacco Corporation: *See—*
Cantrell, Daniel V.; and Halverstadt, Dale A., 4,540,005, Cl. 131-336.000.
Browning, James A. Highly concentrated supersonic material flame spray method and apparatus. 4,540,121, Cl. 239-13.000.
Bruce, Robert A., to Tektronix, Inc. Displaying waveforms. 4,540,938, Cl. 324-121.00R.
Bruckmann, Robert H.: *See—*
Dar, Jamshed B.; Bruckmann, Robert H.; and Kelly, Elisabeth, 4,540,591, Cl. 426-388.000.
Brunion, Hans-Georg; Hiemenz, Christian; Heuser, Hans; and Radisch, Helmer, to Saint-Gobain Vitrage. Flexible, transparent pane for use as a window. 4,540,622, Cl. 428-216.000.
Brunswick Corporation: *See—*
Karls, Michael A., 4,540,009, Cl. 134-167.00R.
Bryant, Jack A. Fail-safe monitoring system. 4,540,886, Cl. 250-554.000.
Bryant & May Limited: *See—*
Lanham, Albert F.; Cox, Michael G. C.; and Etheridge, Richard H., 4,540,419, Cl. 44-42.000.
Budwey, Michael J.: *See—*
Stiffler, Jack J.; Budwey, Michael J.; and Nolan, James M., Jr., 4,541,094, Cl. 371-68.000.
Buijs, Johannes, to Adviesbureau D3BN Civiel Ingenieurs. Method of building a house starting from a packaged structure, a packaged structure for use in said method, a method of making a foundation, and a pile cap for use therein. 4,539,788, Cl. 52-745.000.
Bullock, James K.: *See—*
McCord, Kenneth R.; Bullock, James K.; Gille, Henrick K.; and Gilroy, Keith, 4,539,998, Cl. 128-675.000.
Bump, David S.: *See—*
Baughman, Richard C.; Bump, David S.; and Hubbard, Charles R., 4,540,458, Cl. 156-312.000.
Bunker, James E., to Minnesota Mining and Manufacturing Company. Dentin and enamel adhesive. 4,540,722, Cl. 523-109.000.
Burba, John L., III, to Dow Chemical Company, The. Crystalline 3-layer lithium aluminates. 4,540,509, Cl. 252-184.000.
Burbank, John E., III, to Minnesota Mining and Manufacturing Company. Card separating members for a microfiche storage and retrieval system. 4,540,257, Cl. 353-103.000.
Burke, Michael A., to Westinghouse Electric Corp. Method for production of combustion turbine blade having a hybrid structure. 4,540,038, Cl. 164-499.000.
Burkum, Merlin E.; and O'Regan, Timothy M., to Commonwealth Edison Company. Apparatus for identifying defective electric power distribution capacitors. 4,540,935, Cl. 324-52.000.
Burlington Industries, Inc.: *See—*
Conklin, Delano M.; Hodgin, John B.; and Illman, Walter F., 4,540,610, Cl. 427-434.500.
Leach, Jack, 4,540,311, Cl. 404-72.000.
Burns, Bryan L.; and Callahan, Michael W., to United States of America, Air Force. Bistatic pulse-overlap Doppler radar intrusion detection apparatus. 4,540,978, Cl. 340-554.000.
Burns, William P., Jr. Method and apparatus for cleaning gripper assemblies. 4,540,445, Cl. 134-21.000.
Burr-Brown Corporation: *See—*
Early, Adrian B.; and Lillis, William J., 4,540,900, Cl. 307-289.000.
Burrell, Alfred A. Cabinet structure for storing, displaying and indexing. 4,540,222, Cl. 312-257.00R.
Burroughs Corporation: *See—*
Fuchs, Otto, 4,540,423, Cl. 65-18.100.
Moore, Richard M., 4,541,004, Cl. 357-81.000.
Burroughs Wellcome Co.: *See—*
Hardy, George W.; Lowe, Lawrence A.; and Smith, Terence W., 4,540,682, Cl. 514-18.000.
Burton, Greg, to Fairchild Camera & Instrument Corporation. Semiconductor planarization process and structures made thereby. 4,539,744, Cl. 29-580.000.
Busse, Wolf-Dieter: *See—*
Mardin, Mithat; Busse, Wolf-Dieter; Hoffmeister, Friedrich; Seuter, Friedel; Perzborn, Elisabeth; Schlossmann, Klaus; Mayer, Dieter; and Fiedler, Volker, 4,540,707, Cl. 514-404.000.
Buttolph, John L., III, to Silver Lake Corporation. Electric storage heater system having charging control that transmits charging information over power lines. 4,540,875, Cl. 219-364.000.
BWG Bergwerk-und Walzwerk-Maschinenbau GmbH: *See—*
Noe, Oskar; Noe, Andreas; and Noe, Rolf, 4,539,830, Cl. 72-12.000.
Byers, Jim D.: *See—*
Banasiak, Dennis S.; and Byers, Jim D., 4,540,826, Cl. 568-420.000.
Byrne, Frank, to United States of America, National Aeronautics and Space Administration. Video processor for air traffic control beacon system. 4,540,986, Cl. 343-6.80R.
C-I-L Inc.: *See—*
Day, Philip R.; and Webster, William K., 4,539,909, Cl. 102-275.200.
Cabiedes, Anthony: *See—*
Bowers, Stephen G.; Trueblood, Tim B.; and Cabiedes, Anthony, 4,541,076, Cl. 365-190.000.
Caires, Richard. Counterrotating dual-propeller boat drive. 4,540,369, Cl. 440-81.000.
Calder, John, to Plessey Overseas Limited. Push buttons. 4,540,865, Cl. 200-340.000.
Caldwell Manufacturing Co., Inc.: *See—*
Yonovich, John R.; Newton, William P.; and Dense, Brian S., 4,540,070, Cl. 188-380.000.
Caldwell, Patrick N., to Cessna Aircraft Company, The. Detent hold and release mechanism. 4,539,862, Cl. 74-527.000.
Calfee, Richard V.; Bertasz, Robert N.; Terry, Reese S., Jr.; Gordon, Pat L.; and Baker, Ross G., Jr., to Intermedics, Inc. Method and apparatus for communicating with implanted body function stimulator. 4,539,992, Cl. 128-419.0PG.
Calgon Carbon Corporation: *See—*
Sutt, Robert F., Jr., 4,540,678, Cl. 502-5.000.
Callahan, Michael W.: *See—*
Burns, Bryan L.; and Callahan, Michael W., 4,540,978, Cl. 340-554.000.
Calspan Corporation: *See—*
Michalovic, John G., 4,540,152, Cl. 249-184.000.
Cambelt International Corporation: *See—*
Campbell, Clarence R.; Mickelson, Elliot S.; and Baumgartner, Steven A., 4,540,357, Cl. 425-28.00B.
Camerano, James J.: *See—*
Granger, Stanley W.; and Camerano, James J., 4,540,046, Cl. 166-55.000.
Cameron, Carl A.: *See—*
Herlitz, John E.; and Cameron, Carl A., 4,540,213, Cl. 296-37.500.
Campbell, Bryant A.; DuBois, Dale R.; Manriquez, Ralph F.; and Miller, Nicholas E., to Anicon, Inc. Chemical vapor deposition apparatus. 4,539,933, Cl. 118-719.000.
Campbell, Clarence R.; Mickelson, Elliot S.; and Baumgartner, Steven A., to Cambelt International Corporation. Apparatus for fabricating non-linear side wall conveyor belting. 4,540,357, Cl. 425-28.00B.
Campbell, Iain J.: *See—*
Moran, David P. J.; and Campbell, Iain J., 4,540,593, Cl. 426-603.000.
Campbell, Jeptha E. Needlepointing tool. 4,540,108, Cl. 223-102.000.
Campbell Soup Company: *See—*
Egee, Walter W., 4,539,879, Cl. 83-107.000.
Canada Cup, Inc.: *See—*
Thomas, Tommy; and West, John W., 4,540,543, Cl. 264-526.000.
Canadian Patents and Development Limited: *See—*
Cheng, Richard M. H.; and Lee, Rock S., 4,540,289, Cl. 366-274.000.
Cannady, Daniel L., Jr., to Westinghouse Electric Corp. Antistatic laminates containing long carbon fibers. 4,540,624, Cl. 428-282.000.
Cannady, John P., to Dow Corning Corporation. Hydrosilazane polymers from $[R_3Si]_2NH$ and $HSiCl_3$. 4,540,803, Cl. 556-412.000.
Canon Kabushiki Kaisha: *See—*
Fujiyama, Yasutomo; and Okabe, Shotaro, 4,539,934, Cl. 118-723.000.
Masuda, Shunichi; Furuichi, Katsushi; and Takahata, Naomi, 4,540,170, Cl. 271-259.000.
Saito, Seiji, 4,540,996, Cl. 346-140.00R.
Seto, Susumu, 4,540,250, Cl. 350-438.000.
Shibata, Takehiko, 4,541,044, Cl. 364-200.000.
Toyono, Tsutomu; and Onoda, Shigeyoshi, 4,540,268, Cl. 355-3.00R.
Yamada, Yasuaki, 4,540,299, Cl. 400-708.000.
Cantrell, Daniel V.; and Halverstadt, Dale A., to Brown & Williamson Tobacco Corporation. Cigarette having a mouthpiece. 4,540,005, Cl. 131-336.000.
Cappelletti, Leonard M.: *See—*
Toscano, Luciano; and Cappelletti, Leonard M., 4,540,662, Cl. 435-74.000.
Carbon, Jean M.: *See—*
Amphoux, Andre ; and Carbon, Jean M., 4,540,202, Cl. 285-184.000.
Carey, A. Andrew; and Shor, Joel T., to United States of America, Energy. Method for controlling the viscosity of siloxane oils. 4,540,503, Cl. 252-78.300.
Carey, Glen A.: *See—*
Bradshaw, Randolph F.; and Carey, Glen A., 4,539,854, Cl. 73-864.180.

Carlson, Richard O.; Glascock, Homer H., II; Loughran, James A.; and Webster, Harold F., to General Electric Company. Low loss, multilevel silicon circuit board. 4,541,035, Cl. 361-414.000.

Carracoy, Claudio, to Oftalysine S.r.l. Cosmetic applicator and container assembly for aseptic application of cosmetics. 4,540,007, Cl. 132-88.500.

Carrier Corporation: *See*—
Zinsmeyer, Thomas M., 4,539,820, Cl. 62-201.000.

Carter, John P., Jr.; and Wolgemuth, Richard L., to Adria Laboratories, Inc. 1,4-Dimethoxy naphthalenecarboxamide anticonvulsants. 4,540,814, Cl. 564-172.000.

Carvalho, John A., to RCA Corporation. Multiple input voltage power controller. 4,540,892, Cl. 307-130.000.

Casada, James H.: *See*—
Swetnam, Larry D.; Casada, James H.; and Walton, Linus R., 4,540,054, Cl. 172-292.000.

Casio Computer Co. Ltd.: *See*—
Takashima, Susumu; Kanke, Takao; Inagaki, Naoki; and Fukushima, Kazumasa, 4,541,111, Cl. 381-51.000.
Yuzawa, Keiji, 4,539,882, Cl. 84-1.030.

Cassar, Luigi; Iqbal, Abul; and Rochat, Alain C., to Ciba-Geigy Corporation. Production of β-amino-α,β-unsaturated carboxylic acid esters. 4,540,791, Cl. 546-335.000.

Castle, Thomas M.: *See*—
Hannon, Betty R.; Reusser, Fritz; Dolak, Lester A.; Argoudelis, Alexander D.; and Castle, Thomas M., 4,540,661, Cl. 435-42.000.

Cataldo, Roy S.; and Hall, Arlis, to General Motors Corporation. V-Belt structure. 4,540,388, Cl. 474-242.000.

Caufriez, Jean J.: *See*—
Massengeil, Hans A.; Overmeer, Robert; Pietruska, Joachim; and Caufriez, Jean J., 4,540,166, Cl. 271-3.100.

Cavagna, Elio, to Elio Cavagna S.R.L. Lock and/or release systems, associated in structure and operation to the rests of circular blades or creasers, for cutters or creasing machines to be used industrially in the field of the paper and cardboard manufacturing. 4,540,394, Cl. 493-365.000.

Cawley, James D., to United States of America, National Aeronautics and Space Administration. Oxidizing seal for a turbine tip gas path. 4,540,336, Cl. 415-174.000.

CDA Industries, Inc.: *See*—
Gardner, Arthur W., 4,540,847, Cl. 174-48.000.

Celanese Corporation: *See*—
Wissbrun, Kurt F.; and Orwoll, Richard D., 4,540,737, Cl. 524-599.000.

Celiena (Cell Engineering) A.G.: *See*—
Pierpaoli, Walter; and Maestroni, Georges, 4,540,574, Cl. 424-95.000.

Center, Marc B.: *See*—
Hengel, James F.; Armstrong, Donald J.; Ament, Frank; Center, Marc B.; and Ausen, John E., 4,539,956, Cl. 123-357.000.

Central Glass Company Limited: *See*—
Kawai, Toshikazu; Negishi, Akira; Ojima, Iwao; and Fuchikami, Takamasa, 4,540,835, Cl. 568-842.000.

Central Illinois Public Service Company: *See*—
Wilhelm, James H., 4,540,556, Cl. 423-242.000.

Centre National de la Recherche Scientifique: *See*—
Commeyras, Auguste; Previero, Aldo; and Pugniere, Martine, 4,540,792, Cl. 548-344.000.

Cessna Aircraft Company, The: *See*—
Caldwell, Patrick N., 4,539,862, Cl. 74-527.000.

Chakrawarti, Shekhar: *See*—
Keener, Robert M.; and Chakrawarti, Shekhar, 4,540,891, Cl. 307-118.000.

Chan, Siu-Por. Barbeque forks. 4,539,751, Cl. 30-322.000.

Chaney, John L. Male organ conditioner. 4,539,980, Cl. 128-79.000.

Chang, Clarence D.: *See*—
Miale, Joseph N.; and Chang, Clarence D., 4,540,840, Cl. 585-640.000.
Miale, Joseph N.; and Chang, Clarence D., 4,540,841, Cl. 585-640.000.

Chang, John C.; and Howells, Richard D., to Minnesota Mining and Manufacturing Company. Fluoroaliphatic radical-containing, substituted guanidines and fibrous substrates treated therewith. 4,540,497, Cl. 252-8.800.

Chang, Michael N.; and Hwang, San-Bao, to Merck & Co., Inc. Method for treatment of diseases mediated by PAF using 5-allyl-2-(3,4-Dimethoxyphenyl)-3a,α-methoxy-3-methyl-2,3,3a,6-tetrahydro-6-oxobenzofuran. 4,540,709, Cl. 514-470.000.

Chang, Wen-Hsuan; Ambrose, Ronald R.; McKeough, David T.; Porter, Samuel, Jr.; and Eslinger, Delano R., to PPG Industries, Inc. Thermosetting high solids solvent-based polyester-urethane one-component coating compositions. 4,540,766, Cl. 528-45.000.

Chang, Wen-Hsuan: *See*—
Ambrose, Ronald R.; Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., 4,540,771, Cl. 528-272.000.

Chapman, David D.: *See*—
Sutton, Steven R.; Hagen, Michael S.; Chapman, David D.; Gombert, Glenn S.; and Palmquist, Steven R., 4,541,100, Cl. 375-10.000.

Charlton, Steven C.; Fleming, Roger L.; and Lau, Authur L. Y., to Miles Laboratories, Inc. Compound useful in detecting ion and method of preparing it. 4,540,520, Cl. 260-396.00N.

Chaussy, Christian: *See*—
Forssmann, Bernd; Hepp, Wolfgang; Hoff, Guenter; and Chaussy, Christian, 4,539,989, Cl. 128-328.000.

Chauvin, Jacques; and Molle, Roger, to Compagnie d'electronique et de Piezo-Electricite C.E.P.E. High frequency band-pass amplifier with adjustable impedance and oscillator including it. 4,540,956, Cl. 331-116.00R.

Chemical Research Center: *See*—
Kawai, Toshikazu; Negishi, Akira; Ojima, Iwao; and Fuchikami, Takamasa, 4,540,835, Cl. 568-842.000.

Chemische Werke Huels AG: *See*—
Sielfeld, Gilbert, 4,540,759, Cl. 526-200.000.

Chemische Werke Huls Aktiengesellschaft: *See*—
Kurandt, Hans-Friedrich, 4,540,439, Cl. 106-109.000.

Chen, Anthony B.: *See*—
Harte, Richard A.; Chen, Anthony B.; and Kaufman, Nancy K., 4,540,660, Cl. 435-7.000.

Chen, Ming-Tang. Portable barbecue grill. 4,539,901, Cl. 99-393.000.

Cheng, Richard M. H.; and Lee, Rock S., to Canadian Patents and Development Limited. Automatic stirring system for film developing. 4,540,289, Cl. 366-274.000.

Chevallier, Sammy, to Societe Nationale des Poudres et Explosifs; and Office National d'Etudes et de Recherches Aerospatiales. Polystyryl-pyridine resins having an increased toughness, and composite materials comprising these resins. 4,540,770, Cl. 528-248.000.

Chianelli, Russell R.: *See*—
Seiver, Robert L.; and Chianelli, Russell R., 4,540,482, Cl. 208-215.000.

Chihana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument performing D/A conversion of plural tone signals. 4,539,883, Cl. 84-1.220.

Child, Robin E., to Concentric Pumps Limited. Gerotor pump. 4,540,347, Cl. 417-310.000.

Chin, Gilbert Y.: *See*—
Boredelon, Chester M.; Chin, Gilbert Y.; Jin, Sungho; Sherwood, Richard C.; and Wernick, Jack H., 4,540,453, Cl. 148-31.550.

Chinchen, Godfrey C., to Imperial Chemical Industries PLC. Hydrogen production. 4,540,563, Cl. 423-656.000.

Chiodo, Daniel J.: *See*—
Shirley, Gaylord R.; and Chiodo, Daniel J., 4,539,988, Cl. 128-314.000.

Chiodo, Rudolph J., to Dimedco. Apparatus for photographing body cavities. 4,540,258, Cl. 354-62.000.

Chitose, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Molded transformer with grounded electrically conductive layer. 4,540,967, Cl. 336-84.00C.

Choay S.A.: *See*—
Pierpaoli, Walter; and Maestroni, Georges, 4,540,574, Cl. 424-95.000.

Chou, David T.; Durden, John A.; and D'Silva, Themistocles D. J., to Union Carbide Corporation. Pesticidal phenoxypyridyl benzoyl ureas. 4,540,578, Cl. 514-349.000.

Chrysler Corporation: *See*—
Herlitz, John E.; and Cameron, Carl A., 4,540,213, Cl. 296-37.500.

Chu, Daniel T., to Abbott Laboratories. 1-Pyridine substituted quinobenoxazines and antibacterial use. 4,540,694, Cl. 514-232.000.

Chu, Mike S. H.; Hodgkins, Charles E.; and Rose, Daniel C., to TAM Ceramics. Low temperature fired dielectric ceramic composition with flat TC characteristic and method of making. 4,540,676, Cl. 501-138.000.

Chuiko, Alexei A.; Morev, Anatoly V.; Golovkov, Alexandr S.; Smirnov, Valentin A.; Voronin, Evgeny F.; Evlakhova, Raisa A.; Guba, Galina Y.; Slushnene, Iolita R.; Pasvyanskas, Arunas V.; and Sushko, Roman V. Material for the electrostatic data recording containing silicon and titanium oxides. 4,540,652, Cl. 430-84.000.

Chupp, John P.; and Balthazor, Terry M., to Monsanto Company. Preparation of substituted benzylic halides. 4,540,522, Cl. 260-465.00E.

Chylinski, Victoria S.: *See*—
Trager, Seymour F.; and Chylinski, Victoria S., 4,540,568, Cl. 424-81.000.

Ciba-Geigy AG: *See*—
Smith, Norman A., 4,540,785, Cl. 546-116.000.

Ciba-Geigy Corporation: *See*—
Aufderhaar, Ernst, 4,540,514, Cl. 260-239.00D.
Berner, Godwin; and Rutsch, Werner, 4,540,598, Cl. 427-54.100.
Cassar, Luigi; Iqbal, Abul; and Rochat, Alain C., 4,540,791, Cl. 546-335.000.
Dobinson, Bryan; and Thoseby, Michael R., 4,540,769, Cl. 528-90.000.
Eckhardt, Claude; and Holzle, Gerd, 4,540,518, Cl. 260-242.200.
Falk, Robert A., 4,540,805, Cl. 560-135.000.
Ham, Nancy M., 4,540,750, Cl. 525-504.000.
Meyer, Willy, 4,540,782, Cl. 544-194.000.
Spivack, John D.; Pastor, Stephen D.; and Odorisio, Paul, 4,540,732, Cl. 524-289.000.

Cilco, Inc.: *See*—
Miller, Gabriel M.; Cowen, Timothy B.; and Palin, Philip R., 4,540,405, Cl. 604-232.000.

Cipher Data Products, Inc.: *See*—
Precourt, Normand E., 4,541,019, Cl. 360-15.000.

Citizen Watch Co., Ltd.: *See*—
Okunishi, Mizuho; and Yasunaga, Makoto, 4,540,295, Cl. 400-120.000.

Clancy, Steven J.; Whatley, James F.; and Heinke, Dennis, to Westinghouse Electric Corp. Angle width discriminator/altitude line detector radar. 4,540,985, Cl. 343-5.0DP.

Clark, Charles G.; and Clark, Jack D. Variable resistance exercise apparatus. 4,540,171, Cl. 272-118.000.

Clark, Jack D.: *See*—
Clark, Charles G.; and Clark, Jack D., 4,540,171, Cl. 272-118.000.

Clement, Leonard W. H., to Cooper Canada Limited. Size adjustable helmet. 4,539,715, Cl. 2-420.000.

Clement, Tommy G. Power operated targets for shooting ranges. 4,540,182, Cl. 273-392.000.

Clements, Jack W.: *See—*
Wolfe, Donald L.; Clements, Jack W.; and Kerrey, John S., 4,541,055, Cl. 364-474.000.

Coburn Optical Industries, Inc.: *See—*
Petcen, Donald H.; and Sinclair, Robert I., 4,540,532, Cl. 264-1.100.

Cody, Stuart E., to Esco Corporation. Rigging method and hook therefor. 4,540,209, Cl. 294-74.000.

Coffia, Bob J., to Grace Petroleum Corporation. Security Device. 4,540,322, Cl. 411-338.000.

Coggins, Dolphus L.; and Lindner, Walter E., to McDonnell Douglas Corporation. Process for continuous recovery of nitric acid/hydrofluoric acid titanium etchant. 4,540,465, Cl. 156-642.000.

Colan, Peter V.; Miller, Kenneth L.; and Tyler, Henry P., to Allied Corporation. Servo booster mechanism. 4,539,891, Cl. 91-49.000.

Colby, Edward. Joint for furniture support structure. 4,540,308, Cl. 403-219.000.

Colista, Dominic: *See—*
Johnston, Robert J.; Layciak, Stephen G.; and Colista, Dominic, 4,539,860, Cl. 74-483.0PB.

Collette, Michael L., to Otari Electric Co., Ltd. Resolver with sequential frequency and phase correction. 4,541,023, Cl. 360-73.000.

Collis, Harvey E. Hair roller. 4,540,006, Cl. 132-39.000.

Colombini, Carlo: *See—*
Bocelli, Aureliano; and Colombini, Carlo, 4,540,425, Cl. 65-273.000.
Bocelli, Aureliano; and Colombini, Carlo, 4,540,426, Cl. 65-273.000.

Colosio, Cesare, to Colosio Cesare S.r.l. Device selecting the needles on the dial plate of either single or multiple feed, single cylinder circular knitting machines for the manufacture of ribbed fabric. 4,539,825, Cl. 66-24.000.

Colosio Cesare S.r.l.: *See—*
Colosio, Cesare, 4,539,825, Cl. 66-24.000.

Colquhoun, Alexander; and Kohn, Erhard, to TELEFUNKEN electronic GmbH. Varactor or mixer diode with surrounding substrate metal contact and top surface isolation. 4,541,000, Cl. 357-15.000.

Colt Industries Operating Corp: *See—*
Cowles, Warren H., 4,539,960, Cl. 123-463.000.

Commeyras, Auguste; Previero, Aldo; and Pugniere, Martine, to Centre National de la Recherche Scientifique; and Institut National de la Sante et de la Reserche Medicale. Process for the preparation of a free L α-amino acid. 4,540,792, Cl. 548-344.000.

Commonwealth Edison Company: *See—*
Burkum, Merlin E.; and O'Regan, Timothy M., 4,540,935, Cl. 324-52.000.

Commonwealth Scientific and Industrial Research Organization, The: *See—*
Holan, George; and Walser, Reimund A., 4,540,710, Cl. 514-521.000.

Communications Test Design, Inc.: *See—*
Parsons, Donald F.; Parsons, Gerald J.; Greenwald, Brian D.; and Parsons, Elizabeth A., 4,540,857, Cl. 179-175.210.

Compagnie d'electronique et de Piezo-Electricite C.E.P.E.: *See—*
Chauvin, Jacques; and Molle, Roger, 4,540,956, Cl. 331-116.00R.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Albouy, Pierre; Salahun, Yves; Botquin, Francois; and Cordani, Roberto, 4,540,852, Cl. 179-18.0FA.
Albouy, Pierre, 4,540,853, Cl. 179-18.0FA.

Compression Labs, Inc.: *See—*
Tescher, Andrew G., 4,541,012, Cl. 358-133.000.

Comstock, Bluford M., to ConferTech International, Inc. Digital teleconferencing control device, system and method. 4,541,087, Cl. 370-62.000.

Concast AG: *See—*
Langner, Carl, 4,540,037, Cl. 164-466.000.

Concentric Pumps Limited: *See—*
Child, Robin E., 4,540,347, Cl. 417-310.000.

ConferTech International, Inc.: *See—*
Comstock, Bluford M., 4,541,087, Cl. 370-62.000.

Conklin, Delano M.; Hodgin, John B.; and Illman, Walter F., to Burlington Industries, Inc. Hot melt size applying. 4,540,610, Cl. 427-434.500.

Connolly, Paul A.; and Weston, Barry G., to British Nuclear Fuels Limited. Ion exchange columns. 4,540,488, Cl. 210-268.000.

Conrad, Preston C.; and Jarmas, Alvydas A., to Eli Lilly and Company. Crystalline 7-(R)-amino-3-(1'pyridiniummethyl)-ceph-3-em-4-carboxylate monohydrochloride monohydrate compound. 4,540,779, Cl. 544-24.000.

Consolidated Foods Corporation: *See—*
Bell, Cecil R., Jr.; Lathery, Willie M.; Patel, Navin D.; and London, Jasper R., 4,539,924, Cl. 112-262.200.

Continental Electronics Mfg. Co.: *See—*
Hanna, George D., 4,540,957, Cl. 332-10.000.

Continental Packaging Company, Inc.: *See—*
Blomquist, Leonard A.; and Avery, John, 4,540,460, Cl. 156-571.000.

Contraves Goerz Corporation: *See—*
Jones, Donald H., 4,540,925, Cl. 318-602.000.

Control Data Corporation: *See—*
Shambroom, John R.; and Sliski, Alan P., 4,539,835, Cl. 73-1.00J.

Control Gaging, Inc.: *See—*
Brown, Bernard J.; and Peelle, Thomas B., 4,539,777, Cl. 51-165.00R.

Cooke, Laurence H.; Feretich, Robert A.; and Boyle, Richard F., to Storage Technology Partners. Scannable asynchronous/synchronous CMOS latch. 4,540,903, Cl. 307-465.000.

Coon, Dennis C.: *See—*
Sestak, Joseph T.; and Coon, Dennis C., 4,539,929, Cl. 116-221.000.

Cooper Canada Limited: *See—*
Clement, Leonard W. H., 4,539,715, Cl. 2-420.000.

Cooper Industries, Inc.: *See—*
Maros, Ronald R., 4,540,224, Cl. 339-14.00R.

Cooper, John R.; and Sawyer, Richard G. Portable broadcast band information transmitting system. 4,541,119, Cl. 455-57.000.

Cooper, Robert Q.: *See—*
Smith, Timothy J. C.; Geke, Jurgen; and Cooper, Robert Q., 4,540,442, Cl. 134-2.000.

Coppock, C. Wallace. Game of chance particularly adapted for play in conjunction with a team sport contest. 4,540,174, Cl. 273-138.00R.

Coppock, C. Wallace. Game of chance. 4,540,175, Cl. 273-139.000.

Cordani, Roberto: *See—*
Albouy, Pierre; Salahun, Yves; Botquin, Francois; and Cordani, Roberto, 4,540,852, Cl. 179-18.0FA.

Cordier, Georges, to Rhone-Poulenc Specialites Chimiques. Process for the preparation of metachlorophenols. 4,540,834, Cl. 568-774.000.

Cordis Corporation: *See—*
Hooven, Michael D., 4,540,400, Cl. 604-9.000.
Peers-Trevarton, Charles A., 4,540,236, Cl. 339-45.00R.

Core Laboratories, Inc.: *See—*
Barnaby, Harold T., 4,539,837, Cl. 73-55.000.

Cornell Research Foundation, Inc.: *See—*
Bowers, William S., 4,540,830, Cl. 568-651.000.

Corning Glass Works: *See—*
Boudot, Jean E.; Mazeau, Jean P.; and Prassas, Michel, 4,540,672, Cl. 501-65.000.
Bradshaw, Randolph F.; and Carey, Glen A., 4,539,854, Cl. 73-864.180.
DeAngelis, Thomas P., 4,540,475, Cl. 204-67.000.

Corrado, Giovanni. New unsaturated polyester-based products. 4,540,741, Cl. 525-43.000.

Corrigall, Don J.; Hansen, Floyd D.; and Kujawa, James R., to Miller Electric Manufacturing Company. Welding gun with multi-directional switch. 4,540,871, Cl. 219-137.630.

Corwin, Michael A.; and Foster, George N., to Union Carbide Corporation. Anti-block compounds for extrusion of transition metal catalyzed resins. 4,540,538, Cl. 264-211.000.

Costerousse, Germain: *See—*
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 4,540,686, Cl. 514-179.000.

Costruzioni Aeronautiche Giovanii Agusta S.p.A.: *See—*
Pariani, Emilio, 4,540,340, Cl. 416-145.000.

Cote, Roger A.: *See—*
Seufert, Wolf D.; and Cote, Roger A., 4,541,113, Cl. 382-4.000.

Council For Mineral Technology: *See—*
Curr, Thomas R.; and Schmidt, Ingrid E., 4,540,433, Cl. 75-10.00R.

Cove, Harry R., to Cove, Harry R.; and Williams, Gary R. Choke for drilling or production use. 4,540,022, Cl. 137-625.300.

Covitch, Michael J.; and Sweetapple, Gary G., to Diamond Shamrock Chemicals Company. Method for making finely divided perfluorocarbon copolymer. 4,540,716, Cl. 521-28.000.

Cowdery, James R.; Park, David B.; and Khoylian, Rouzas R., to Santrade Ltd. Unlatch assembly for a conveyor system. 4,540,083, Cl. 198-465.100.

Cowen, Timothy B.: *See—*
Miller, Gabriel M.; Cowen, Timothy B.; and Palin, Philip R., , 4,540,405, Cl. 604-232.000.

Cowles, Warren H., to Colt Industries Operating Corp. Fuel pressure regulator. 4,539,960, Cl. 123-463.000.

Cox, Michael G. C.: *See—*
Lanham, Albert F.; Cox, Michael G. C.; and Etheridge, Richard H., 4,540,419, Cl. 44-42.000.

Cozewith, Charles; Ju, Shiaw; and VerStrate, Gary W., to Exxon Research & Engineering Co. Narrow MWD alpha-olefin copolymers. 4,540,753, Cl. 526-88.000.

Crawford, Gerald R.; and Kozlowski, Brian J., to International Pipe Machinery Corp. Method and apparatus for production of concrete pipe by the packerhead method. 4,540,539, Cl. 264-269.000.

Crean, Peter A., to Xerox Corporation. Ink jet printer with droplet throw distance correction. 4,540,990, Cl. 346-75.000.

Crennan, Gerard: *See—*
Mautner, Jacob E.; Crennan, Gerard; and Anderson, Arnold N., 4,539,727, Cl. 16-285.000.

Croset, Michel; Dieumegard, Dominique; and Pribat, Didier, to Thomson-CSF. Process for manufacturing a semi-conductor device of the type comprising at least one silicon layer deposited on an insulating substrate. 4,540,452, Cl. 148-175.000.

Cross, David E., to Bard Limited. Fluid flow control valve. 4,540,156, Cl. 251-309.000.

Croxford, George A.; and Hackett, Anthony M., to Hotpoint Limited. Method and device for forming a branch connection in a pipe. 4,540,011, Cl. 137-15.000.

Crump, Druce K.: *See—*
Wilson, David A.; and Crump, Druce K., 4,540,508, Cl. 252-180.000.

Crumrine, Robert E.: *See—*
Minerd, Timothy M.; and Crumrine, Robert E., 4,540,887, Cl. 250-561.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni SpA: *See—*
Grego, Giorgio, 4,540,130, Cl. 242-18.00G.

Cuisinarts, Inc.: *See*—
Breeden, John W., 4,540,128, Cl. 241-37.500.

Cukor, Peter: *See*—
McDonald, Robert C.; Wang, Wei-Tao; Cukor, Peter; and Rubner, Michael F., 4,540,641, Cl. 429-105.000.

Curr, Thomas R.; and Schmidt, Ingrid E., to Council For Mineral Technology. Treatment of ferromanganese. 4,540,433, Cl. 75-10.00R.

Curti, Ezio. Device for automatically transferring printed circuit base plates from the loading to the printing zone. 4,540,084, Cl. 198-468.300.

Cuscurida, Michael: *See*—
Speranza, George P.; Cuscurida, Michael; and Dominguez, Richard J. G., 4,540,768, Cl. 528-79.000.

Cusimano, Sharon I. Stuffed figure having positionable arms. 4,540,378, Cl. 446-369.000.

Cutler, David S.; and Spouse, Keith G., to EMI Limited. Relating to tape transport control systems. 4,540,920, Cl. 318-7.000.

D B Industries, Inc.: *See*—
Wolner, James T., 4,539,732, Cl. 24-241.00R.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Horiguchi, Satoru; and Amemiya, Shinichi, 4,539,839, Cl. 73-73.000.

Daikin Kogyo Co., Ltd.: *See*—
Ishikawa, Nobuo; and Takaoka, Akio, 4,540,524, Cl. 260-465.400.

Daimler-Benz Aktiengesellschaft: *See*—
Fleischer, Horst, 4,539,897, Cl. 98-49.000.

Daitoku, Koichi; and Okabe, Nobuo, to Nippon Kogaku K.K. Photographing lens focusing device. 4,540,264, Cl. 354-400.000.

Dale, Lawrence A.; Grenleski, Stephen E., Jr.; Keirsey, James L.; and Stevens, Charles E., to United States of America, Navy. Multi-port dump combustor. 4,539,811, Cl. 60-270.100.

Dalworth Construction Inc.: *See*—
Rice, William C., 4,539,780, Cl. 52-169.600.

Dancy, William B.: *See*—
Hunt, Richard B.; Dancy, William B.; and Alexander, James B., 4,540,577, Cl. 424-153.000.

Dane, Roy. Trailer hitch. 4,540,194, Cl. 280-491.00B.

Danielsen, Kenneth D.; and Winarski, Daniel J., to International Business Machines Corporation. Method of force/acceleration reel tape sizing. 4,541,027, Cl. 360-137.000.

Dansk Industri Syndikat A/S: *See*—
Jensen, Kaj J., 4,540,036, Cl. 164-323.000.

Dantlgraber, Jorg, to Mannesmann Rexroth GmbH. Pressure control valve. 4,540,018, Cl. 137-540.000.

Dar, Jamshed B.; Bruckmann, Robert H.; and Kelly, Elisabeth, to General Foods Corporation. Robusta coffee steaming, roasting and blending method. 4,540,591, Cl. 426-388.000.

Dartmouth College: *See*—
Walsh, John E., 4,540,936, Cl. 324-61.00P.

Daryl Laboratories, Inc.: *See*—
Harte, Richard A.; Chen, Anthony B.; and Kaufman, Nancy K., 4,540,660, Cl. 435-7.000.

Das, Suryya K.: *See*—
Olson, Kurt G.; Das, Suryya K.; and Dowbenko, Rostyslaw, 4,540,740, Cl. 524-811.000.

Data Technology Corporation: *See*—
Alsobrook, Lawrence C., 4,540,133, Cl. 242-71.800.

Datascope Corp.: *See*—
Mans, Thomas A., 4,539,999, Cl. 128-696.000.
Wolvek, Sidney, 4,540,404, Cl. 604-96.000.

David, Allan P.: *See*—
Bindra, Perminder S.; David, Allan P.; Gałasco, Raymond T.; Gasdik, Charles E.; Light, David N.; and Pickar, Paul B., 4,540,473, Cl. 204-52.00R.

David, Gary L.; and Harrington, David W. Grain auger closing spout. 4,540,086, Cl. 198-536.000.

Davidson, Richard L. Firewood storing and dispensing apparatus. 4,540,107, Cl. 221-194.000.

Davies, Anthony R., to VFP Fluid Power Limited. Diaphragm pumps. 4,540,346, Cl. 417-273.000.

Davis, Bayard C., to XCO International, Inc. Heat sensitive cable. 4,540,972, Cl. 338-26.000.

Davis, Martin I.: *See*—
Ashbeck, Robert M., 4,541,117, Cl. 383-64.000.

Davis, Stanley S.; and Gaylord, Norman G., to Forest Laboratories, Inc. Prolonged release drug dosage forms based on modified low viscosity grade hydroxypropylmethylcellulose. 4,540,566, Cl. 424-22.000.

Day, Philip R.; and Webster, William K., to C-I-L Inc. Detonating assembly with U-bend of low energy detonating cord. 4,539,909, Cl. 102-275.200.

Day, Samuel W., Jr., to Motorola, Inc. Whip antenna assembly exhibiting increased durability. 4,540,989, Cl. 343-900.000.

Dayen, William R. Removal of Sox, Nox, and particulate from combusted carbonaceous fuels. 4,540,554, Cl. 423-235.000.

Dayton Machine Tool Company: *See*—
Siler, G. Daniel, 4,540,872, Cl. 219-159.000.

DeAngelis, Thomas P., to Corning Glass Works. Electrolytic Al production with reactive sintered ceramic components of boride-oxide phases. 4,540,475, Cl. 204-67.000.

DeBarbieri, Augusto; and Bekesi, Julius G., to Proter S.p.A. In vitro and in vivo treatment of cancer cells and treatment of viruses with a tripeptide compound. 4,540,683, Cl. 514-18.000.

de Cooker, Mario G. R. T.: *See*—
van Nassau, Petrus J. M.; Biermans, Andreas J.; Jonckers, Kees; and de Cooker, Mario G. R. T., 4,540,813, Cl. 564-71.000.

Dedelmahr, Rudolf: *See*—
Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; and Pfeiffer, Richard, 4,540,536, Cl. 264-102.000.

Deere & Company: *See*—
Hoch, John J., 4,540,191, Cl. 280-5.00A.
Jackson, Robert C.; and Luchsinger, Patrick M., 4,540,540, Cl. 264-272.110.
Kaukaskie, Donald C., 4,539,863, Cl. 74-540.000.
Roeth, Kenneth M.; and Ihm, Gerald J., 4,540,220, Cl. 301-125.000.
Wetrich, Peter D., 4,540,078, Cl. 192-87.110.

Delgado, Gary M.: *See*—
Sidhu, Pawitter S.; and Delgado, Gary M., 4,541,025, Cl. 360-99.000.

Delpercio, Mariano; and Molloy, Edward W., to General Motors Corporation. Combined bearing and variable speed viscous coupling. 4,540,075, Cl. 192-58.00R.

Demain, Arnold L.: *See*—
Johnson, Eric A.; Demain, Arnold L.; and Madia, Ashwin, 4,540,664, Cl. 435-99.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Iwasaki, Takao; Ito, Higashi; and Watanabe, Seiichi, 4,540,838, Cl. 570-229.000.

Denny, Thomas: *See*—
Barson, Craig; and Denny, Thomas, 4,540,398, Cl. 604-1.000.

Dense, Brian S.: *See*—
Yonovich, John R.; Newton, William P.; and Dense, Brian S., 4,540,070, Cl. 188-380.000.

Denucci, John F.: *See*—
Klasen, Daniel A.; and Denucci, John F., 4,540,207, Cl. 292-341.170.

Denyers Pty. Ltd.: *See*—
Green, John F.; and Morris, Richard A., 4,540,165, Cl. 269-325.000.

Deraedt, Roger: *See*—
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 4,540,686, Cl. 514-179.000.

Derichs, Josef, to W. Schlafhorst & Co. Method and apparatus for starting the operation of a friction spinning machine. 4,539,804, Cl. 57-263.000.

Derrien, Michel: *See*—
Veaux, Jacques; and Derrien, Michel, 4,540,142, Cl. 244-102.00R.

DeSantis, John. Security display rack. 4,540,092, Cl. 211-4.000.

Detonics Small Arms, Ltd.: *See*—
Sirkis, Nahemia, 4,539,771, Cl. 42-64.000.

Deutsch Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e. V.: *See*—
Gauert, Rolf; and Jungbluth, Werner W., 4,540,284, Cl. 356-350.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Liebing, Lothar, 4,540,868, Cl. 219-121.0PM.

Devroede, Emile M.: *See*—
Herten, Joris F. A.; and Devroede, Emile M., 4,540,736, Cl. 524-556.000.

Dewing, Kenneth M.: *See*—
Ashbeck, Robert M., 4,541,117, Cl. 383-64.000.

de Wit, Benjamino: *See*—
Wesseling, Karel H.; and de Wit, Benjamino, 4,539,997, Cl. 128-667.000.

Diamond Shamrock Chemicals Company: *See*—
Covitch, Michael J.; and Sweetapple, Gary G., 4,540,716, Cl. 521-28.000.

Dickerson, Richard C.; and Miller, William S., to Ecolochem, Inc. Process for treating wash water from the manufacture of terephthalic acid. 4,540,493, Cl. 210-669.000.

Diehr, Hans-Joachim: *See*—
Forster, Heinz; Diehr, Hans-Joachim; Stetter, Jorg; Eue, Ludwig; and Schmidt, Robert R., 4,540,430, Cl. 71-90.000.

Diesel Equipment Limited: *See*—
Martin, Paul, 4,540,329, Cl. 414-545.000.

Dieterich, Dieter: *See*—
Rasshofer, Werner; Grogler, Gerhard; Konig, Klaus; and Dieterich, Dieter, 4,540,720, Cl. 521-159.000.

Dieterman, Alfred J.: *See*—
McCaffrey, Eugene F.; Dieterman, Alfred J.; and Knazko, Luba, 4,540,511, Cl. 252-321.000.

Dieumegard, Dominique: *See*—
Croset, Michel; Dieumegard, Dominique; and Pribat, Didier, 4,540,452, Cl. 148-175.000.

Dill, Frederick H.; Ling, Daniel T.; and Matick, Richard E., to International Business Machines Corporation. Random access memory having a second input/output port. 4,541,075, Cl. 365-189.000.

Dilmore, James A.: *See*—
Beer, Janos M.; Dilmore, James A.; Vermes, Geza; and Young, William E., 4,539,918, Cl. 110-266.000.

Di Marchi, Silvio J.: *See*—
Merl, Milton J.; and Di Marchi, Silvio J., 4,540,093, Cl. 211-59.100.

Dimedco: *See*—
Chiodo, Rudolph J., 4,540,258, Cl. 354-62.000.

Dirscherl, Teresa A.: *See*—
Tessler, Martin M.; Dirscherl, Teresa A.; and Wurzburg, Otto B., 4,540,778, Cl. 536-114.000.

Disko, Harry: *See*—
Rehkemper, Steven F.; Hanson, Steven P.; and Disko, Harry, 4,540,377, Cl. 446-430.000.

Ditcher, Eric A.: *See*—
Ditcher, Jack; and Ditcher, Eric A., 4,540,310, Cl. 404-25.000.

Ditcher, Jack; and Ditcher, Eric A., to A-Lok Products, Inc. Manhole riser and cooperating sleeve to provide a waterlock for manhole structures. 4,540,310, Cl. 404-25.000.

Djordjevic, Ilja; Eheim, Franz; and Laufer, Helmut, to Robert Bosch GmbH. Fuel injection pump structure for an internal combustion engine. 4,539,964, Cl. 123-509.000.

Dobinson, Bryan; and Thoseby, Michael R., to Ciba-Geigy Corporation. Preparation of N-glycidyl compounds. 4,540,769, Cl. 528-90.000.

Doble Engineering Company: *See*—
Allfather, Lars P., 4,541,040, Cl. 363-37.000.

Dr. Babor GmbH & Co.: *See*—
Schimanski, Dieter, 4,540,571, Cl. 424-81.000.

Dr. -Ing. Rudolf Hell GmbH: *See*—
Pointner, Martin; and Sommer, Rudiger, 4,540,151, Cl. 249-93.000.

Doerschner, David L.: *See*—
Nystrom, Wilford O.; Riedel, Kenneth E.; and Doerschner, David L., 4,540,409, Cl. 604-349.000.

Doherty, Richard F.; and Pierry, Anthony, to OCG Technology Inc. Signal conditioner for biological signals. 4,540,000, Cl. 128-696.000.

Dolak, Lester A.: *See*—
Hannon, Betty R.; Reusser, Fritz; Dolak, Lester A.; Argoudelis, Alexander D.; and Castle, Thomas M., 4,540,661, Cl. 435-42.000.

Doliner, Herbert: *See*—
Johne, Hans; Jentzsch, Arndt; Doliner, Herbert; Frenzel, Werner; Forster, Karl-Heinz; and Naumann, Johannes, 4,539,907, Cl. 101-248.000.

Doljack, Frank A., to B. F. Goodrich Company, The. Method and apparatus for updating event information. 4,541,063, Cl. 364-550.000.

Dombek, Bernard D., to Union Carbide Corporation. Process for producing methanol from synthesis gas. 4,540,712, Cl. 518-700.000.

Dominguez, Richard J. G.: *See*—
Speranza, George P.; Cuscurida, Michael; and Dominguez, Richard J. G., 4,540,768, Cl. 528-79.000.

Donner, Meinrad, to Maag Gear-Wheel & Machine Company Limited. Method of compensating for dressing tool wear during the dressing of grinding wheels. 4,539,779, Cl. 51-325.000.

Doorakian, George A.; and Hanafin, Joseph W., to Dow Chemical Company, The. Tetrahydrocarbyl phosphonium salts. 4,540,823, Cl. 568-10.000.

Dornier System GmbH: *See*—
Forssmann, Bernd; Hepp, Wolfgang; Hoff, Guenter; and Chaussy, Christian, 4,539,989, Cl. 128-328.000.

Doug Nash Equipment & Engineering: *See*—
Frost, Barry L., 4,539,856, Cl. 74-363.000.

Dow Chemical Company, The: *See*—
Burba, John L., III, 4,540,509, Cl. 252-184.000.
Doorakian, George A.; and Hanafin, Joseph W., 4,540,823, Cl. 568-10.000.
Hefner, Robert E., Jr., 4,540,745, Cl. 525-401.000.
Hefner, Robert E., Jr., 4,540,829, Cl. 568-634.000.
Im, Jang-hi; and Shrum, William E., 4,540,623, Cl. 428-220.000.
Kirchhoff, Robert A., 4,540,763, Cl. 526-281.000.
McFadden, Russell T., 4,540,752, Cl. 525-531.000.
Wilson, David A.; and Crump, Druce K., 4,540,508, Cl. 252-180.000.
Wright, Terry L., 4,540,786, Cl. 546-162.000.

Dow Corning Corporation: *See*—
Cannady, John P., 4,540,803, Cl. 556-412.000.

Dowa Mining Co., Ltd.: *See*—
Kawaguchi, Seiji; Fujiwara, Takeki; Kodama, Shigeo; Ito, Haruo; and Yamamoto, Kyuemon, 4,540,065, Cl. 182-63.000.

Dowbenko, Rostyslaw: *See*—
Olson, Kurt G.; Das, Suryya K.; and Dowbenko, Rostyslaw, 4,540,740, Cl. 524-811.000.

Downs, David A.; and Tecle, Haile, to Warner-Lambert Company. Diphenylmethylene piperidines. 4,540,780, Cl. 544-129.000.

Dowzall, Martin E.; and Houssian, Vazgen J., to Esselte Pendaflex Corporation. Apparatus for use with dry transfer lettering sheets. 4,539,759, Cl. 33-184.500.

Dresser Industries, Inc.: *See*—
Randall, Russel R., 4,540,883, Cl. 250-262.000.
Smith, John R. E., 4,541,081, Cl. 367-168.000.
Walkow, Arnold M., 4,540,941, Cl. 324-221.000.

Drewry, Hugh S.; and Keszthelyi, Ewald, to Kohler Company. Vertical shaft engine generator set for a recreational vehicle or the like. 4,540,888, Cl. 290-1.00R.

Driver, Michael J., to Beecham Group p.l.c. β-Lactam antibiotics. 4,540,688, Cl. 514-196.000.

Drumco: *See*—
Drummond, Donald D.; Johnsey, Walter F.; and Wood, Roy W., 4,340,055, Cl. 175-323.000.

Drummond, Donald D.; Johnsey, Walter F.; and Wood, Roy W., to Drumco. Drill bit assembly having improved operational life. 4,540,055, Cl. 175-323.000.

D'Silva, Themistocles D. J.: *See*—
Chou, David T.; Durden, John A.; and D'Silva, Themistocles D. J., 4,540,578, Cl. 514-349.000.

Du, Benjamin R. Air driven pump. 4,540,349, Cl. 417-393.000.

DuBois, Dale R.: *See*—
Campbell, Bryant A.; DuBois, Dale R.; Manriquez, Ralph F.; and Miller, Nicholas E., 4,539,933, Cl. 118-719.000.

Dubois, Jean-Daniel, to Nouvelle Lemania S.A. Horology module comprising an electronic circuit and a calendar device. 4,540,291, Cl. 368-28.000.

Duce, Benjamin R.: *See*—
Wood, Grace; Duce, Benjamin R.; Pelham, Russell W.; and Woiszwillo, James, 4,540,410, Cl. 604-56.000.

DuFrene, Clement O., to Rosenmeier, Gordon, a part interest. Transplanters. 4,539,920, Cl. 111-2.000.

Dugas, Matthew P.: *See*—
Bonin, Wayne A.; and Dugas, Matthew P., 4,541,026, Cl. 360-121.000.

Dumbri, Austin C.; and Procyk, Frank J., to AT&T Bell Laboratories. Memory using multiplexed row and column address lines. 4,541,078, Cl. 365-230.000.

Dummer, Gerhard: *See*—
Schmidhammer, Ludwig; Dummer, Gerhard; Haselwarter, Klaus; and Strasser, Rudolf, 4,540,837, Cl. 570-211.000.

Dunn, Robert N. Surgical gloves and surface treatment of surgical gloves for avoiding starch peritonitis and the like. 4,540,407, Cl. 604-292.000.

Dunnavant, William R.; Gardikes, John J.; and Langer, Heimo J., to Ashland Oil Inc. Phenolic resin-polyisocyanate binder systems containing a phosphorus halide and use thereof. 4,540,724, Cl. 523-143.000.

Du Pont de Nemours, E. I., and Company: *See*—
Loomis, Gary L., 4,540,719, Cl. 521-89.000.
Roberts, Winston J., 4,540,746, Cl. 525-408.000.
Siuta, Vincent P., 4,540,604, Cl. 427-96.000.
Squire, Edward N., 4,540,799, Cl. 549-448.000.

Durden, John A.: *See*—
Chou, David T.; Durden, John A.; and D'Silva, Themistocles D. J., 4,540,578, Cl. 514-349.000.

Durno, Ronald A.; and Huber, Rudolph F., to United Technologies Corporation. Fail-safe tail rotor control system. 4,540,141, Cl. 244-17.190.

Durr, Frederick E.: *See*—
Murdock, Keith C.; and Durr, Frederick E., 4,540,519, Cl. 260-380.000.
Murdock, Keith C.; and Durr, Frederick E., 4,540,583, Cl. 514-656.000.

Dyer, Christopher K., to AT&T Bell Laboratories. Procedure for making nickel electrodes. 4,540,476, Cl. 204-96.000.

Dynamit Nobel AG: *See*—
Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; van der Maas, Hendrikus; and Suerken, Hans-Peter, 4,540,777, Cl. 536-102.000.

Dynamold International: *See*—
Lefebvre, Guy, 4,540,161, Cl. 266-95.000.

Dzewaltowski, Victor F.; and Gile, Richard H., to Ex-Cell-O Corporation. Automatic dual compensation grinding wheel conditioner. 4,539,778, Cl. 51-165.870.

E. R. Squibb & Sons, Inc.: *See*—
Feld, Jerome H., 4,539,852, Cl. 73-847.000.

E.S.P. Systems, Inc.: *See*—
Beery, John C.; and Witzke, Kenneth, 4,539,752, Cl. 33-18.00B.

Earhart, Jack R.: *See*—
Johnson, John K.; Earhart, Jack R.; Astrom, Gordon L.; and Herbig, Mark A., 4,540,487, Cl. 210-264.000.

Early, Adrian B.; and Lillis, William J., to Burr-Brown Corporation. Reduced swing latch circuit utilizing gate current proportional to temperature. 4,540,900, Cl. 307-289.000.

Eastman Kodak Company: *See*—
Baughman, Richard C.; Bump, David S.; and Hubbard, Charles R., 4,540,458, Cl. 156-312.000.
Borsenberger, Paul M., 4,540,647, Cl. 430-128.000.
Harvey, Donald M., 4,540,265, Cl. 354-417.000.
Jacobs, Merrit N., 4,539,855, Cl. 73-864.250.
Krishnamurthy, Sundaram, 4,540,657, Cl. 430-546.000.
Meyer, Max F., Jr.; Bond, Gary L.; and McConnell, Richard L., 4,540,749, Cl. 325-437.000.
Rakov, David M., 4,540,271, Cl. 355-3.00R.

Eastmond, Bruce C.; and Richardson, Julian H., to Motorola, Inc. SSB System with pilot coded squelch. 4,541,118, Cl. 455-35.000.

Eaton Corporation: *See*—
Bopp, Warren G., 4,540,076, Cl. 192-58.00B.
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,541,001, Cl. 357-23.400.

Ebert, Klaus-Peter: *See*—
Schneider, Walter; Ebert, Klaus-Peter; and Otto, Konrad, 4,540,183, Cl. 277-1.000.

Ebner, Peter. Pusher-type furnace. 4,540,364, Cl. 432-234.000.

Eckhardt, Claude; and Holzle, Gerd, to Ciba-Geigy Corporation. Zinc and aluminum phthalocyanines. 4,540,518, Cl. 260-242.200.

Ecolochem, Inc.: *See*—
Dickerson, Richard C.; and Miller, William S., 4,540,493, Cl. 210-669.000.

Edo Western Corporation: *See*—
Lapetina, Robert A.; and Jones, Howard P., 4,540,981, Cl. 340-618.000.

Edwards, D. Brandon. Bilevel telemicroscopic apparatus. 4,540,238, Cl. 350-146.000.

Egee, Walter W., to Campbell Soup Company. Method and apparatus for forming and processing food spears. 4,539,879, Cl. 83-107.000.

Eggerding, Carl L.; and Giess, Edward A. Dielectric substrates comprising cordierite and method of forming the same. 4,540,621, Cl. 428-209.000.

Eguchi, Yzsuhito: *See*—
Kariya, Izumi; and Eguchi, Yzsuhito, 4,540,991, Cl. 346-76.0PH.

Eheim, Franz: *See—*
Djordjevic, Ilja; Eheim, Franz; and Laufer, Helmut, 4,539,964, Cl. 123-509.000.
Ehrenberg, Jorgen: *See—*
Konnemann, Alfred; and Ehrenberg, Jorgen, 4,540,234, Cl. 339-259.00R.
Eisai Co., Ltd.: *See—*
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,540,704, Cl. 514-389.000.
El Paso Polyolefins Company: *See—*
Hattori, Kiyoshi; and Myers, John H., 4,540,416, Cl. 604-410.000.
El Paso Products Company: *See—*
Allen, George C., 4,540,842, Cl. 585-823.000.
Eldridge, Vernon F. Fishing line choke for the rod of a spinning reel. 4,539,773, Cl. 43-25.000.
Electronova S.A.: *See—*
Spengler, Walter, 4,539,908, Cl. 101-426.000.
Eli Lilly and Company: *See—*
Conrad, Preston C.; and Jarmas, Alvydas A., 4,540,779, Cl. 544-24.000.
Schaus, John M., 4,540,787, Cl. 546-164.000.
Elio Cavagna S.R.L.: *See—*
Cavagna, Elio, 4,540,394, Cl. 493-365.000.
Ellenberger & Poensgen GmbH: *See—*
Krasser, Fritz; and Peter, Josef, 4,540,864, Cl. 200-302.200.
Elliott, Lewis D.: *See—*
Schanne, Joseph F.; and Elliott, Lewis D., 4,540,974, Cl. 340-347.0AD.
Ellsworth, John C.: *See—*
Zelek, Thomas T.; and Ellsworth, John C., 4,540,042, Cl. 165-96.000.
Ellsworth, William D. Pneumatic potentiometer. 4,540,026, Cl. 137-862.000.
EMI Limited: *See—*
Cutler, David S.; and Spouse, Keith G., 4,540,920, Cl. 318-7.000.
Endo, Hiroshi: *See—*
Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; Furukawa, Osamu; Endo, Hiroshi; Hirao, Osamu; and Hayashi, Masaru, 4,540,971, Cl. 338-21.000.
Energy Exchange Systems: *See—*
Binkley, Bruce I., 4,540,929, Cl. 320-2.000.
Engel, Michael R., to Minnesota Mining and Manufacturing Company. Conductive adhesive and biomedical electrode. 4,539,996, Cl. 128-640.000.
English, George J.: *See—*
Rothwell, Harold L.; and English, George J., 4,540,373, Cl. 445-22.000.
Ennis, John J.; and Booher, Robert K., to United States of America, Air Force. Tri-state type driver circuit. 4,540,904, Cl. 307-473.000.
Enomoto, Ryo; and Tsukada, Kiyotaka, to Ibiden Kabushiki Kaisha. Process for producing a power composition for producing sintered ceramic articles. 4,540,677, Cl. 501-151.000.
Entreprise Generale Industrielle: *See—*
Tzincoca, Alexandre, 4,540,150, Cl. 249-20.000.
Environmental Research Institute of MI: *See—*
Lougheed, Robert M., 4,541,116, Cl. 382-49.000.
Eoga, Anthony B. J., to Warner-Lambert Company. Denture cleaner having improved dissolution time and clarity and method of preparation. 4,540,504, Cl. 252-99.000.
Epino, Jose G. Apparatus for adjusting the spacing between sheaves. 4,540,387, Cl. 474-136.000.
Ermer, Wolfgang; and Muhlbauer, Klemens, to Heliotronic Forschungs-und Entwicklungsgesellshaft fur Solarzellen-Grundstoffe. Method for the multiple lap-cutting of crystal blocks with continuous shortening of the blade excursion. 4,539,972, Cl. 125-16.00R.
Erskine, James C., Jr.: *See—*
Mac Iver, Bernard A.; Erskine, James C., Jr.; and Bierlein, John C., 4,540,636, Cl. 428-610.000.
Eschen, Werner: *See—*
Hagenlocher, Walter; Rapp, Lutz; Eschen, Werner; Ragaly, Istvan; Scharpf, Heinz; Streller, Jorg; Weigand, Johann; and Winkler, Klaus, 4,540,907, Cl. 310-68.00D.
Escher Wyss GmbH: *See—*
Wuhrer, Wolfgang, 4,540,341, Cl. 416-157.00R.
Esco Corporation: *See—*
Cody, Stuart E., 4,540,209, Cl. 294-74.000.
Eskelinen, Pekka; and Vuorinen, Vesa, to Valmet OY. Pocket ventilating apparatus for a multi-cylinder dryer of a paper machine. 4,539,762, Cl. 34-114.000.
Eslinger, Delano R.: *See—*
Chang, Wen-Hsuan; Ambrose, Ronald R.; McKeough, David T.; Porter, Samuel, Jr.; and Eslinger, Delano R., 4,540,766, Cl. 528-45.000.
Esselte Pendaflex Corporation: *See—*
Dowzall, Martin E.; and Houssian, Vazgen J., 4,539,759, Cl. 33-184.500.
Esterl, Robert; and Weiser, Josef, to Siemens Aktiengesellschaft. Relay with bridge contact spring. 4,540,963, Cl. 335-133.000.
Etheridge, Richard H.: *See—*
Lanham, Albert F.; Cox, Michael G. C.; and Etheridge, Richard H., 4,540,419, Cl. 44-42.000.
Ethyl Corporation: *See—*
Lilje, Kenneth C., 4,540,795, Cl. 548-239.000.
Ramachandran, Venkataraman, 4,540,793, Cl. 546-346.000.
Eue, Ludwig: *See—*
Forster, Heinz; Diehr, Hans-Joachim; Stetter, Jorg; Eue, Ludwig; and Schmidt, Robert R., 4,540,430, Cl. 71-90.000.
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert, 4,540,827, Cl. 568-442.000.
Evans, Anthony C., to Kelsey-Hayes Company. Self-adjusting parking brake. 4,540,066, Cl. 188-71.900.
Evans, Harold R., to Tekron Licensing B.V. Friction type exercising device. 4,540,172, Cl. 272-133.000.
Evlakhova, Raisa A.: *See—*
Chuiko, Alexei A.; Morev, Anatoly V.; Golovkov, Alexandr S.; Smirnov, Valentin A.; Voronin, Evgeny F.; Evlakhova, Raisa A.; Guba, Galina Y.; Slushnene, Iolita R.; Pasvyanskas, Arunas V.; and Sushko, Roman V., 4,540,652, Cl. 430-84.000.
Ewing, Ed. Vine stapler. 4,540,112, Cl. 227-152.000.
Ewing, John G. Heart monitor for horses. 4,540,001, Cl. 128-706.000.
Ex-Cell-O Corporation: *See—*
Dzewaltowski, Victor F.; and Gile, Richard H., 4,539,778, Cl. 51-165.870.
Exxon Research & Engineering Co.: *See—*
Cozewith, Charles; Ju, Shiaw; and VerStrate, Gary W., 4,540,753, Cl. 526-88.000.
Grimes, Patrick G., 4,540,639, Cl. 429-17.000.
Peiffer, Dennis G.; Lundberg, Robert D.; Walker, Thad O.; and Turner, S. Richard, 4,540,496, Cl. 252-8.50A.
Sawyer, Willard H.; and Mitchell, Howard L., III, 4,540,481, Cl. 208-215.000.
Seiver, Robert L.; and Chianelli, Russell R., 4,540,482, Cl. 208-215.000.
Turner, S. Richard, 4,540,762, Cl. 526-262.000.
Eyquem: *See—*
Matesco, Michel G. P., 4,540,912, Cl. 313-142.000.
Ezawa, Sadaaki, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,539,885, Cl. 84-1.250.
F.H. Schule GmbH: *See—*
Vick, Walter; and Suhrbier, Rolf, 4,539,904, Cl. 99-618.000.
F. Happel Tief-und Strassenbau GmbH: *See—*
Happel, Friedrich; and Heller, Gunter, 4,540,327, Cl. 414-352.000.
F. L. Smidth & Co.: *See—*
Larsen, Erik R., 4,540,085, Cl. 198-519.000.
Fairand, Barry P.: *See—*
Junod, John E.; and Fairand, Barry P., 4,540,392, Cl. 493-303.000.
Fairchild Camera & Instrument Corporation: *See—*
Burton, Greg, 4,539,744, Cl. 29-580.000.
Falconbridge Limited: *See—*
O'Hanlon, Thomas A., 4,540,056, Cl. 175-393.000.
Falk, Robert A., to Ciba-Geigy Corporation. Di-perfluoroalkyl carbamyl group containing acrylates and methacrylates. 4,540,805, Cl. 560-135.000.
Falkner, Chester B., Jr., to Fluor Subsea Services, Inc. Tension leg means and method of installing same for a marine platform. 4,540,314, Cl. 405-227.000.
Fanning, William J., to AT&T Technologies, Inc. Electrical terminal and method of securing same in circuit substrate thru-hole. 4,541,034, Cl. 361-405.000.
Fantone, Stephen D., to Polaroid Corporation. Holographic optical apparatus for use with expanded-beam type fiber optical components. 4,540,246, Cl. 350-3.700.
Fanuc Limited: *See—*
Inaba, Hajimu; and Nihei, Ryo, 4,540,212, Cl. 294-88.000.
Nakashima, Seiichiro; Inaba, Hajimu; and Inagaki, Shigemi, 4,540,332, Cl. 414-744.00R.
Faraci, Arthur, to Grumman Aerospace Corporation. Test equipment interconnection system. 4,540,227, Cl. 339-17.00F.
Fast, Jacob. Merchandise information tag. 4,539,766, Cl. 40-22.000.
Fattori, Joseph E., to Waldwick Plastics Corporation. Submergible self-priming dispenser. 4,539,717, Cl. 4-228.000.
Faulkner, Neil P.; and Prue, Walter W., Jr., to John Fluke Mfg. Co., Inc. Direct volts calibrator. 4,541,065, Cl. 364-571.000.
Federal Motors, Inc.: *See—*
Wormser, Robert S.; and Barton, Bruce C., 4,540,095, Cl. 212-187.000.
Feigt, Ingmar; and Wersing, Wolfram, to Siemens Aktiengesellschaft. Apparatus for contact-free measurement of electrical charge images generated by electro-radiographic recording methods. 4,541,017, Cl. 358-295.000.
Feld, Jerome H., to E. R. Squibb & Sons, Inc. Vial cap torque tester. 4,539,852, Cl. 73-847.000.
Fenton, Donald M., to Union Oil Company of California. Hemologation of alkanols. 4,540,836, Cl. 568-902.000.
Ference, Jonathan H.: *See—*
Luchaco, David G.; and Ference, Jonathan H., 4,540,917, Cl. 315-291.000.
Feretich, Robert A.: *See—*
Cooke, Laurence H.; Feretich, Robert A.; and Boyle, Richard F., 4,540,903, Cl. 307-465.000.
Fergason, James L. Method and apparatus for converting phase-modulated light to amplitude-modulated light and communication method and apparatus employing the same. 4,540,243, Cl. 350-337.000.
Fernandez, Douglas R.: *See—*
Brown, Robert J.; Fernandez, Douglas R.; and McGonigal, Charles, 4,539,748, Cl. 29-874.000.
Ferro, Francesco; and Franci, Giosue , to Officine Savio S.p.A. Device to piece-up yarn and doff yarn packages on open-end spinning machines. 4,539,803, Cl. 57-263.000.

Fichtel & Sachs AG: *See*—
Link, Achim, 4,540,079, Cl. 192-109.00R.
Fiedler, Volker: *See*—
Mardin, Mithat; Busse, Wolf-Dieter; Hoffmeister, Friedrich; Seuter, Friedel; Perzborn, Elisabeth; Schlossmann, Klaus; Mayer, Dieter; and Fiedler, Volker, 4,540,707, Cl. 514-404.000.
Fiedziuszko, Slawomir J., to Ford Aerospace & Communications Corporation. Dual mode cavity stabilized oscillator. 4,540,955, Cl. 331-107.0DP.
Field, Martin J.: *See*—
Atkins, Terrance J.; Field, Martin J.; and Lamirande, Donald J., 4,539,961, Cl. 123-468.000.
Field, Robert D. Resilient feed auger attachment. 4,539,801, Cl. 56-364.000.
Fields, Ellis K., to Standard Oil Company (Indiana). Phosphites and phosphates of 3-sulfoxy-1,2-propylene glycols. 4,540,527, Cl. 260-949.000.
Filatov, Nikolai Y.: *See*—
Musin, Rafail M.; Gryaznov, Mikhail I.; Timofeev, Dmitry A.; Filatov, Nikolai Y.; and Andreeva, Tamara S., 4,541,070, Cl. 364-900.000.
Filion, Gilles: *See*—
Pelletier, Jean; Filion, Gilles; and Potvin, Clement, 4,540,032, Cl. 144-3.00D.
Finkelstein, Manuel: *See*—
Ross, Sidney D.; and Finkelstein, Manuel, 4,541,037, Cl. 361-433.000.
Finn, Bernard J.; and Yew, Ming-Chih, to General Motors Corporation. Vehicle wheel suspension. 4,540,197, Cl. 280-697.000.
Finn, George A., to West Company, The. Coating composition for elastomeric packaging components. 4,540,632, Cl. 428-422.000.
Finnigan Corporation: *See*—
Stafford, George C.; Kelley, Paul E.; and Stephens, David R., 4,540,884, Cl. 250-282.000.
Fischer, Hermann: *See*—
Pipper, Gunter; Schmidt, Franz; Theysohn, Rainer; Riegger, Siegfried; Heil, Eduard; Fischer, Hermann; Thoma, Richard; and Matthies, Paul, 4,540,772, Cl. 528-335.000.
Fischer, Isabella, administrator: *See*—
Fitzer, Erich; Brennfleck, Karl; and Schlichting, Jurgen, deceased, 4,540,606, Cl. 427-247.000.
Fischer, Peter: *See*—
Hirsch, Martin; Fischer, Peter; and Serbent, Harry, 4,540,432, Cl. 75-43.000.
Fischer & Porter Company: *See*—
Appel, Eggert; Geisler, Gottfried; and Kiene, Wilfried, 4,539,853, Cl. 73-861.120.
Fishler, Mark K.: *See*—
Morris, Martin; and Fishler, Mark K., 4,540,675, Cl. 501-99.000.
Fishman, Max; and Nichols, James D., to Jones Futura Foundation, Ltd. Television signal bandwidth reduction using variable rate transmission. 4,541,008, Cl. 358-13.000.
Fitzer, Erich; Brennfleck, Karl; and Schlichting, Jurgen, deceased (by Fischer, Isabella, administrator), to MTU Motoren-und Turbinen-Union Munchen GmbH. Method of forming a heat-barrier layer on a metal substrate. 4,540,606, Cl. 427-247.000.
Fitzpatrick, John F. Inspection tool. 4,539,753, Cl. 33-169.00C.
Flatau, Abraham, to United States of America, Army. Projectile. 4,539,911, Cl. 102-374.000.
Fleischer, Horst, to Daimler-Benz Aktiengesellschaft. Duct system for a track-guided vehicle. 4,539,897, Cl. 98-49.000.
Fleming, Roger L.: *See*—
Charlton, Steven C.; Fleming, Roger L.; and Lau, Authur L. Y., 4,540,520, Cl. 260-396.00N.
Floegel, Karl: *See*—
Junger, Martin; and Floegel, Karl, 4,540,123, Cl. 239-102.000.
Flow Industries, Inc.: *See*—
O'Hanlon, Thomas A., 4,540,056, Cl. 175-393.000.
Flow Systems, Inc.: *See*—
Arnold, Eugene E., 4,540,320, Cl. 409-232.000.
Fluchel, Donald G., to Progressive Recovery, Inc. Solvent distillation unit with adjustable scrapers. 4,540,471, Cl. 202-175.000.
Fluor Subsea Services, Inc.: *See*—
Falkner, Chester B., Jr., 4,540,314, Cl. 405-227.000.
Fogarty, A. Edward; and Fogarty, Bonnie R. Graphic arts toy. 4,540,375, Cl. 446-146.000.
Fogarty, Bonnie R.: *See*—
Fogarty, A. Edward; and Fogarty, Bonnie R., 4,540,375, Cl. 446-146.000.
Fokker B.V.: *See*—
Kester, Gerardus J. A. N., 4,540,873, Cl. 219-200.000.
Forberg, Hans J., to TRANSCODAN, Sven Husted-Andersen GmbH & Co. KG. Check valve for infusion and transfusion apparatus. 4,540,027, Cl. 137-848.000.
Forbes, Carman S.: *See*—
Forbes, David R.; and Forbes, Carman S., 4,539,772, Cl. 43-3.000.
Forbes, David R.; and Forbes, Carman S., to Hunter's Specialties, Inc. Adapters for converting certain plastic bottles into decoys for duck hunters. 4,539,772, Cl. 43-3.000.
Ford Aerospace & Communications Corporation: *See*—
Fiedziuszko, Slawomir J., 4,540,955, Cl. 331-107.0DP.
Forenade Fabriksverken: *See*—
Backlund, Lennart, 4,540,041, Cl. 165-45.000.
Foresman, Robert R. Telescoping pole. 4,539,927, Cl. 114-89.000.
Forest Laboratories, Inc.: *See*—
Davis, Stanley S.; and Gaylord, Norman G., 4,540,566, Cl. 424-22.000.
Forjas Taurus S.A.: *See*—
Bornancini, Jose C. M., 4,539,770, Cl. 42-7.000.
Forney, Edgar W., Jr., to AMP. Connector for semirigid coaxial cable. 4,540,231, Cl. 339-94.00C.
Forssmann, Bernd; Hepp, Wolfgang; Hoff, Guenter; and Chaussy, Christian, to Dornier System GmbH. Injury-free coupling and decoupling of therapeutic shock waves. 4,539,989, Cl. 128-328.000.
Forster, Heinz; Diehr, Hans-Joachim; Stetter, Jorg; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidally active novel substituted 3-trichloromethyl-1,2,4-thiadiazol-5-yl-oxyacetamides. 4,540,430, Cl. 71-90.000.
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert, to Bayer Aktiengesellschaft. Phenoxybenzene derivatives. 4,540,827, Cl. 568-442.000.
Forster, Karl-Heinz: *See*—
Johne, Hans; Jentzsch, Arndt; Doliner, Herbert; Frenzel, Werner; Forster, Karl-Heinz; and Naumann, Johannes, 4,539,907, Cl. 101-248.000.
Foster, George N.: *See*—
Corwin, Michael A.; and Foster, George N., 4,540,538, Cl. 264-211.000.
Foster, Michael R.: *See*—
Marchent, Brian G.; and Foster, Michael R., 4,539,760, Cl. 33-356.000.
Fowler, John H.: *See*—
Baugh, Benton F.; Henderson, Herman O., Jr.; and Fowler, John H., 4,540,053, Cl. 166-348.000.
Furley, Richard G.; and Fowler, John H., 4,540,013, Cl. 137-75.000.
Fox, Bryce J., to Minnesota Mining and Manufacturing Company. Heat and liquid recovery using open cycle heat pump system. 4,539,816, Cl. 62-87.000.
Fraleigh, M. Foster. Variable volume dual action rheometer. 4,539,838, Cl. 73-59.000.
Frame, William R.; and Vickers, James H., to Southco, Inc. Adjustable draw latch. 4,540,206, Cl. 292-66.000.
Franci, Giosue : *See*—
Ferro, Francesco; and Franci, Giosue , 4,539,803, Cl. 57-263.000.
Franckowiak, Gerhard: *See*—
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,540,789, Cl. 546-274.000.
Stoltefuss, Jurgen; Franckowiak, Gerhard; Boshagen, Horst; Goldmann, Siegfried; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,540,684, Cl. 514-32.000.
Francotyp Gesellschaft mbH: *See*—
Knoth, Norbert; and Miehe, Friedrich V., 4,541,053, Cl. 364-466.000.
Franke, Albrecht; Muller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Gunther; Muller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, to BASF Aktiengesellschaft. Aminopropanol derivatives of 2-hydroxy-β-phenyl-propiophenones, pharmaceutical compositions and use. 4,540,697, Cl. 514-255.000.
Franke, Paul W. U.; Glaser, Wolfgang; Gebhard, Georg R. U.; and Hein, Klaus R. G., to Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft. Method of removing sulfur dioxide and other toxic and noxious components from flue gases. 4,540,555, Cl. 423-242.000.
Frankel, Betty S. Lighted magnifying lens device. 4,540,239, Cl. 350-235.000.
Fratti, Franco. Heat conductive clothing material particularly useful in the field of thermal garments. 4,539,714, Cl. 2-108.000.
Frazer, Hugh I., to Ifield Engineering Pty. Limited. Self regulating hydrostatic pad bearings. 4,540,221, Cl. 308-5.00R.
Frazer, Hugh I., to Ifield Engineering Pty. Limited. Precompression valve for hydraulic pumps. 4,540,345, Cl. 417-269.000.
Frazier, Charles, to American Cyanamid Company. Disinfectant spray cleanser containing glycol ethers. 4,540,505, Cl. 252-106.000.
Freed, Meier E.; and Abou-Gharbia, Magid A., to American Home Products' Corporation. Benzocycloalkane amines. 4,540,806, Cl. 560-139.000.
Freed, Melvyn N. Pryer-plier tool. 4,539,873, Cl. 81-311.000.
Freeman, Gerald C., to Pitney Bowes Inc. Adjustable inclined plane downstop for a load cell. 4,540,057, Cl. 177-154.000.
French, Richard J.: *See*—
Mayhew, Harry W.; French, Richard J.; and Rekers, Louis J., 4,540,755, Cl. 526-100.000.
Frenzel, Werner: *See*—
Johne, Hans; Jentzsch, Arndt; Doliner, Herbert; Frenzel, Werner; Forster, Karl-Heinz; and Naumann, Johannes, 4,539,907, Cl. 101-248.000.
Fresenius AG: *See*—
Lolachi, Houshang; Mathieu, Bernd; and Weber, Wolfram, 4,540,397, Cl. 494-84.000.
Freund Industry Company, Limited: *See*—
Takasaka, Yuko; and Tsujino, Takuichi, 4,540,602, Cl. 427-213.310.
Fridman, Semyon D.: *See*—
Bonsack, James P.; and Fridman, Semyon D., 4,540,551, Cl. 423-77.000.
Friedrich Grohe Armaturenfabrik GmbH & Co.: *See*—
Pawelzik, Manfred, 4,540,023, Cl. 137-625.170.
Fries, Carl J., Jr., to International Paper Company. Method and apparatus for skiving and hemming. 4,540,391, Cl. 493-287.000.
Frola, Pasquale. Method and composition for protecting an electrical grounding device. 4,540,845, Cl. 174-7.000.

Frost, Barry L., to Doug Nash Equipment & Engineering. Two-speed auxiliary transmission. 4,539,856, Cl. 74-363.000.

Frost, Richard B.: *See—*
Antony, Gabriel; and Frost, Richard B., 4,539,754, Cl. 33-169.00R.

Fruitstone, Mitchell J.: *See—*
Roman, Daniel P., Jr.; and Fruitstone, Mitchell J., 4,540,565, Cl. 424-11.000.

Fuchikami, Takamasa: *See—*
Kawai, Toshikazu; Negishi, Akira; Ojima, Iwao; and Fuchikami, Takamasa, 4,540,835, Cl. 568-842.000.

Fuchs, Otto, to Burroughs Corporation. Methods of fashioning glass bonded device. 4,540,423, Cl. 65-18.100.

Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Renker, Wolfgang; and Kober, Roland, to VEB Leuna Werke "Walter Ulbricht". Method for the removal of oxygen dissolved in water. 4,540,494, Cl. 210-750.000.

Fuhrer, Hans-Jurgen: *See—*
Kerpers, Werner; Bonk, Werner; Roser, Dieter; and Fuhrer, Hans-Jurgen, 4,539,737, Cl. 29-423.000.

Fuji Electric Co., Ltd.: *See—*
Kuroki, Kazuo, 4,540,945, Cl. 328-134.000.

Fuji Electrochemical Co., Ltd.: *See—*
Torii, Michihiro; Kosaka, Tomoyoshi; Maeda, Takeo; and Rikukawa, Hiroshi, 4,540,500, Cl. 252-62.580.

Fuji Photo Film Co., Ltd.: *See—*
Arai, Fuminori; and Kitajima, Masao, 4,540,670, Cl. 436-170.000.
Kaida, Shinichi; and Uchiyama, Kaoru, 4,540,456, Cl. 156-159.000.
Kogane, Mikio; and Yamazaki, Seiichi, 4,540,324, Cl. 414-20.000.
Konishi, Masahiro; and Murakoshi, Makoto, 4,541,021, Cl. 360-35.100.
Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, 4,540,654, Cl. 430-381.000.
Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, 4,540,655, Cl. 430-410.000.
Tamura, Kaoru; and Sakamoto, Kiichiro, 4,540,167, Cl. 271-11.000.

Fuji Xerox Co., Ltd.: *See—*
Kikuchi, Yoshiki, 4,541,072, Cl. 365-29.000.

Fujieda, Sadao: *See—*
Hidaka, Toshiyuki; Sakamoto, Hisashi; Fukuhara, Toshiaki; Fujieda, Sadao; and Misawa, Yutaka, 4,540,603, Cl. 427-82.000.

Fujii, Teruo; Fukushima, Hiroshi; and Nakai, Nobuo, to Hitachi, Ltd. Remote control system. 4,540,856, Cl. 179-89.000.

Fujimaki, Yoshihide; Takei, Yoshiaki; and Nomori, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Electrophotographic photosensitive member. 4,540,651, Cl. 430-72.000.

Fujimoto, Akira. FM Signal demodulating apparatus. 4,540,947, Cl. 329-50.000.

Fujimura, Ryuta, to Nissan Motor Co., Ltd. Noise and vibration reducing apparatus for use in exhaust system of engine. 4,540,064, Cl. 181-227.000.

Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. 2-Acetoxy-4-(2-bornyloxy) butane. 4,540,812, Cl. 560-256.000.

Fujisaki, Masaru: *See—*
Noda, Azusa; Fujitaka, Nobuo; and Fujisaki, Masaru, 4,540,193, Cl. 280-284.000.

Fujisawa, Hiroshi: *See—*
Shibata, Setsuo; Koshiba, Yukihiko; Hamamoto, Yoshito; Kugai, Katsutoshi; Kawashima, Akiro; and Fujisawa, Hiroshi, 4,540,490, Cl. 210-323.200.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Ueda, Ikuo; Kato, Masayuki; and Kasai, Yoshiharu, 4,540,692, Cl. 514-225.000.
Ueda, Ikuo; Morino, Daizo; and Takimoto, Koichi, 4,540,701, Cl. 514-357.000.

Fujitaka, Nobuo: *See—*
Noda, Azusa; Fujitaka, Nobuo; and Fujisaki, Masaru, 4,540,193, Cl. 280-284.000.

Fujitsu Limited: *See—*
Abe, Fumitaka; Kimura, Masatoshi; Watanabe, Toshihiko; and Yamada, Hiroshi, 4,540,272, Cl. 355-4.000.
Nakano, Motoo, 4,541,074, Cl. 365-178.000.
Shimada, Hiroshi, 4,541,002, Cl. 357-51.000.

Fujiwara, Akira: *See—*
Harada, Haruo; Fujiwara, Akira; Hatanaka, Yoshio; and Iimura, Hironori, 4,540,590, Cl. 426-324.000.

Fujiwara, Kenji: *See—*
Watanabe, Akira; Takeuchi, Yoshimitsu; Shinoda, Noboru; Isono, Tetsusaburo; and Fujiwara, Kenji, 4,540,674, Cl. 501-97.000.

Fujiwara, Takeki: *See—*
Kawaguchi, Seiji; Fujiwara, Takeki; Kodama, Shigeo; Ito, Haruo; and Yamamoto, Kyuemon, 4,540,065, Cl. 182-63.000.

Fujiyama, Yasutomo; and Okabe, Shotaro, to Canon Kabushiki Kaisha. Plasma vapor deposition film forming apparatus. 4,539,934, Cl. 118-723.000.

Fukami, Yasuhiko: *See—*
Sawada, Toshiichi; Fukami, Yasuhiko; and Kinkori, Shuzo, 4,539,947, Cl. 123-52.00M.

Fukatsu, Kunio, to Toshiba Corporation. Bag processing unit of an automatic transaction machine. 4,540,106, Cl. 221-13.000.

Fukuda Denshi Kabushiki Kaisha: *See—*
Segawa, Kiyoshi, 4,539,995, Cl. 128-639.000.

Fukuda, Hideo: *See—*
Honda, Nobuyasu; Matsui, Toshikazu; Fushida, Akira; Ikeda, Toshimitsu; Takahashi, Kenji; Fukuda, Hideo; Kamezaki, Yasushi; and Teshima, Takashi, 4,540,645, Cl. 430-122.000.

Fukuhara, Toshiaki: *See—*
Hidaka, Toshiyuki; Sakamoto, Hisashi; Fukuhara, Toshiaki; Fujieda, Sadao; and Misawa, Yutaka, 4,540,603, Cl. 427-82.000.

Fukumoto, Ryutaro; Oyagi, Shuji; Yoshida, Yukio; and Akimoto, Ryosaku, to Mitsubishi Jukogyo Kabushiki Kaisha. Air temperature control system for vehicles. 4,540,040, Cl. 165-12.000.

Fukushima, Hiroshi: *See—*
Fujii, Teruo; Fukushima, Hiroshi; and Nakai, Nobuo, 4,540,856, Cl. 179-89.000.

Fukushima, Kazumasa: *See—*
Takashima, Susumu; Kanke, Takao; Inagaki, Naoki; and Fukushima, Kazumasa, 4,541,111, Cl. 381-51.000.

Fukushima, Masakazu: *See—*
Maruyama, Masanori; Fukushima, Masakazu; Kato, Shinichi; and Ogusu, Chihaya, 4,540,916, Cl. 315-16.000.

Furley, Richard G.; and Fowler, John H., to Smith International, Inc. Fire responsive stem retention apparatus. 4,540,013, Cl. 137-75.000.

Furmaga, Walter V. Shrub rug. 4,539,800, Cl. 56-329.000.

Furuichi, Katsushi: *See—*
Masuda, Shunichi; Furuichi, Katsushi; and Takahata, Naomi, 4,540,170, Cl. 271-259.000.

Furukawa, Osamu: *See—*
Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; Furukawa, Osamu; Endo, Hiroshi; Hirao, Osamu; and Hayashi, Masaru, 4,540,971, Cl. 338-21.000.

Furusho, Takao: *See—*
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,540,689, Cl. 514-196.000.

Furutachi, Nobuo: *See—*
Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, 4,540,654, Cl. 430-381.000.

Furutani, Toshinobu: *See—*
Sakurai, Shigenori; Kamo, Takashi; and Furutani, Toshinobu, 4,540,479, Cl. 204-427.000.

Furuya, Tsuneo; and Hori, Katsuya, to Sony Corporation. Method and apparatus for error correction. 4,541,093, Cl. 371-40.000.

Fushida, Akira: *See—*
Honda, Nobuyasu; Matsui, Toshikazu; Fushida, Akira; Ikeda, Toshimitsu; Takahashi, Kenji; Fukuda, Hideo; Kamezaki, Yasushi; and Teshima, Takashi, 4,540,645, Cl. 430-122.000.

Futaba Denshi Kogyo K.K.: *See—*
Morimoto, Kiyoshi; and Watanabe, Hiroshi, 4,540,983, Cl. 340-772.000.

Futagi, Masaaki: *See—*
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,539,869, Cl. 74-866.000.

G. D. Searle & Co.: *See—*
Nysted, Leonard N.; and Pappo, Raphael, 4,540,801, Cl. 549-465.000.

G.M. Pfaff AG: *See—*
Klundt, Kurt, 4,539,922, Cl. 112-221.000.

Gagne, Robert, to PPG Industries, Inc. Enhanced pneumatic regenerator flow control. 4,540,361, Cl. 432-30.000.

Gaida, Walter E.; and Kun, Zoltan K., to Westinghouse Electric Corp. Apparatus for growing crystals. 4,540,550, Cl. 422-109.000.

Gajewski, Robert J., to General Mills, Inc. Cereal presweetened with aspartame and cold water soluble gum coating and method of preparation. 4,540,587, Cl. 426-96.000.

Galasco, Raymond T.: *See—*
Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; Gasdik, Charles E.; Light, David N.; and Pickar, Paul B., 4,540,473, Cl. 204-52.00R.

Galber Automazione E: *See—*
Gangemi, Giovanni; and Sefusatti, Giuseppe, 4,540,890, Cl. 307-40.000.

Gammill, Ronald B., to Upjohn Company, The. Antiatherosclerotic aminoethenyl furochromones. 4,540,798, Cl. 549-387.000.

Gangemi, Giovanni; and Sefusatti, Giuseppe, to Galber Automazione E. System for selectively addressing electrical control signals from a control unit to a plurality of remote units. 4,540,890, Cl. 307-40.000.

Garcea, Giampaolo, to Alfa Romeo Auto S.p.A. Supercharging system for internal combustion engines. 4,539,815, Cl. 60-599.000.

Garcea, Giampaolo; and Surace, Filippo, to Alfa Romeo Auto S.p.A. Temperature-controlling system for the liquid coolant of a motor car internal-combustion engine. 4,539,944, Cl. 123-41.060.

Garcia, Sonny Q.: *See—*
O'Keeffe, William F.; and Garcia, Sonny Q., 4,539,783, Cl. 52-200.000.

Gardikes, John J.: *See—*
Dunnavant, William R.; Gardikes, John J.; and Langer, Heimo J., 4,540,724, Cl. 523-143.000.

Gardner, Arthur W., to CDA Industries, Inc. Electrified ceiling system. 4,540,847, Cl. 174-48.000.

Gardner, Harry E., to Umetco Minerals Corporation. Process for the production of vanadyl hydrate. 4,540,562, Cl. 423-592.000.

Garst, Roger H.; Tuller, Frank N.; and Tucker, Charles R., to National Distillers and Chemical Corporation. Liquid quaternary ammonium antistatic compositions. 4,540,521, Cl. 260-459.00A.

Garvison, Geary L. Bowstring release device. 4,539,968, Cl. 124-35.00A.

Gasdik, Charles E.: *See—*
Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; Gasdik, Charles E.; Light, David N.; and Pickar, Paul B., 4,540,473, Cl. 204-52.00R.

Gassmann, Zean Z.: *See*—
Hawkins, Jeffrey T.; and Gassmann, Zean Z., 4,540,049, Cl. 166-272.000.
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Shores, Marvin W., 4,540,293, Cl. 374-130.000.
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Park, John N., 4,540,894, Cl. 307-254.000.
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Sugalski, Raymond K., 4,539,746, Cl. 29-730.000.
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Dar, Jamshed B.; Bruckmann, Robert H.; and Kelly, Elisabeth, 4,540,591, Cl. 426-388.000.
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Gajewski, Robert J., 4,540,587, Cl. 426-96.000.
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Cataldo, Roy S.; and Hall, Arlis, 4,540,388, Cl. 474-242.000.
Delpercio, Mariano; and Molloy, Edward W., 4,540,075, Cl. 192-58.00R.
Finn, Bernard J.; and Yew, Ming-Chih, 4,540,197, Cl. 280-697.000.
Gresley, Ross A.; Leech, Howard E.; and Smock, Alan L., 4,540,962, Cl. 335-131.000.
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Kade, Alexander; and Karadsheh, Sam M., 4,540,923, Cl. 318-561.000.
Klomp, Edward D., 4,539,954, Cl. 123-188.0VA.
Koivunen, Erkki A., 4,539,866, Cl. 74-665.0GE.
Landries, Richard V.; and Ress, Robert A., Jr., 4,541,036, Cl. 361-426.000.
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Madonio, Andrew M.; and Gulick, Michael H., 4,539,775, Cl. 49-255.000.
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Meloche, /Kenneth R.; McLeish, James G.; and Libkie, Herbert A., 4,540,188, Cl. 280-6.00R.
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Schmerda, Joseph M.; and Piojda, Clarence F., 4,540,223, Cl. 339-3.00S.
Schroeder, Thaddeus; and Ryan, William P., 4,539,841, Cl. 73-116.000.
Short, William T.; Ottaviani, Robert A.; and Hart, Donald J., 4,540,734, Cl. 524-507.000.
Stanner, Donald; and Hughes, Walton, 4,540,331, Cl. 414-730.000.
Teerman, Richard F., 4,540,122, Cl. 239-88.000.
Toepel, Richard R., 4,539,948, Cl. 123-65.0BA.
Vecellio, Anthony M., 4,539,932, Cl. 118-697.000.
Williams, Donald L., 4,539,959, Cl. 123-456.000.
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Gentile, Anthony L.: *See*—
Sashital, Sanat K.; Joyce, Robert L.; and Gentile, Anthony L., 4,540,461, Cl. 156-624.000.
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Gerger, Edward J.; and Gerger, Scott A. Grip-responsive operator alertness monitor. 4,540,979, Cl. 340-576.000.
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Gerling, Paul: *See*—
Lamperski, Heinrich; and Gerling, Paul, 4,540,294, Cl. 384-273.000.
Giess, Edward A.: *See*—
Eggerding, Carl L.; and Giess, Edward A., 4,540,621, Cl. 428-209.000.
Giessen, Bill C., to Northeastern University. Method for rapid solidification processing of multiphase alloys having large liquidus-solidus temperature intervals. 4,540,546, Cl. 420-590.000.
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Dzewaltowski, Victor F.; and Gile, Richard H., 4,539,778, Cl. 51-165.870.
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McCord, Kenneth R.; Bullock, James K.; Gille, Henrick K.; and Gilroy, Keith, 4,539,998, Cl. 128-675.000.
Gilmore, Thomas F.; and Ratliff, Hershel E., to Stearns & Foster Company, The. Carcass shroud and method of application. 4,540,616, Cl. 428-131.000.
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Giordano, Salvatore, to United States of America, Energy. Monochromatic radio frequency accelerating cavity. 4,540,960, Cl. 333-228.000.
Givol, Benny, to Altmann, Micha; and Ben-Yehuda, Yoel, part interest to each. Cylinder lock permitting extraction of broken key. 4,539,829, Cl. 70-454.000.
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Glock, Gaston. Automatic pistol with counteracting spring control mechanism. 4,539,889, Cl. 89-147.000.
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Lamperski, Heinrich; and Gerling, Paul, 4,540,294, Cl. 384-273.000.
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Wegner, Karl-Heinz; Hodes, Erich; and Mann, Horst, 4,540,630, Cl. 428-408.000.
Gmohling, Werner: *See*—
Wolfsgruber, Friedrich; Weiser, Ernst A.; Gmohling, Werner; Kern, Hans; and Reifferscheid, Karl J., 4,540,436, Cl. 75-130.00A.
Gochermann, Hans; Schmidt, Wilfried; Rasch, Klaus-Dieter; and Tentscher, Karl-Heinz, to Licentia Patent-Verwaltungs-GmbH; and Telefunken Electronic GmbH. Solar cell. 4,540,843, Cl. 136-251.000.
Goel, Anil B.; and Tufts, Timothy A., to Ashland Oil, Inc. Polymers based on bicyclic amide acetals/polyepoxides/polyisocyanates. 4,540,767, Cl. 528-60.000.

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Lee, Charles K.; Peters, Rex B.; and Gogic, Aleksandar M., 4,541,105, Cl. 377-19.000.

Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, to Bayer Aktiengesellschaft. Circulation-active novel chromone-and thiochromone-substituted 1,4-dihydropyridines. 4,540,789, Cl. 546-274.000.

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Gombert, Glenn S.: *See*—
Sutton, Steven R.; Hagen, Michael S.; Chapman, David D.; Gombert, Glenn S.; and Palmquist, Steven R., 4,541,100, Cl. 375-10.000.

Gomi, Koichi; and Nishio, Shigeru, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Temperature sensitive negative-pressure control valve. 4,540,153, Cl. 251-11.000.

Goossens, Bjorn O.: *See*—
Paping, Max G.; and Goossens, Bjorn O., 4,540,196, Cl. 280-646.000.

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Calfee, Richard V.; Bertasz, Robert N.; Terry, Reese S., Jr.; Gordon, Pat L.; and Baker, Ross G., Jr., 4,539,992, Cl. 128-419.0PG.

Gorney, Moshe; Lerner, Michael; and Shavit, Amos, to Naan Mechanical Works. Rotary sprinkler having selectable area coverage. 4,540,125, Cl. 239-232.000.

Gotoh, Noboru: *See*—
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Gould, Inc.: *See*—
Tsao, Kuey-Yeou, 4,540,607, Cl. 427-253.000.

Gozlan, Armand. Gas-scrubbing and metal-refining process and system. 4,540,162, Cl. 266-146.000.

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Coffia, Bob J., 4,540,322, Cl. 411-338.000.

Gradl, Reinhard; and Schimmel, Gunther, to Hoechst Aktiengesellschaft. Process for reducing the fluorine content in wet-processed phosphoric acid. 4,540,557, Cl. 423-321.00R.

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Grady, John K.; and Rice, Paul G., to Grady, John K. X-Ray apparatus with tilting table. 4,541,108, Cl. 378-196.000.

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Rossi, Remo J., 4,541,107, Cl. 378-146.000.

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Battle, Billy J.; Graham, Robert M.; Jones, Lawrence S.; Malizio, Andrew B.; and Rhodes, George F., 4,540,204, Cl. 285-231.000.

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Witt, Paul R., 4,540,663, Cl. 435-99.000.

Grallert, Hans-Joachim, to Siemens Aktiengesellschaft. Quantizer for a DPCM encoder. 4,540,973, Cl. 340-347.0DD.

Grallert, Hans-Joachim, to Siemens Aktiengesellschaft. High-speed difference pulse code modulation coder. 4,541,102, Cl. 375-30.000.

Grammes, Hartwig: *See*—
Haas, Peter; Avar, Geza; and Grammes, Hartwig, 4,540,626, Cl. 428-318.800.

Granger, Stanley W.; and Camerano, James J., to NL Industries, Inc. Shear ram apparatus. 4,540,046, Cl. 166-55.000.

Graveling, Frederick J.: *See*—
Peck, Alan M.; Reedman, David C.; Graveling, Frederick J.; Moore, David; and Mansfield, Graham J., 4,541,054, Cl. 364-474.000.

Graves, William H., Jr.: *See*—
Hester, Benny L.; and Graves, William H., Jr., 4,539,836, Cl. 73-49.300.

Gravley, Mark L.: *See*—
Henderson, E. Webb; and Gravley, Mark L., 4,540,560, Cl. 423-445.000.

Gray Tool Company: *See*—
Bridges, Charles D., 4,540,012, Cl. 137-72.000.

Green, John F.; and Morris, Richard A., to Denyers Pty. Ltd. Operating table. 4,540,165, Cl. 269-325.000.

Greenwald, Brian D.: *See*—
Parsons, Donald F.; Parsons, Gerald J.; Greenwald, Brian D.; and Parsons, Elizabeth A., 4,540,857, Cl. 179-175.210.

Grego, Giorgio, to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA. Drum for winding filamentary material. 4,540,130, Cl. 242-18.00G.

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Grendol, Clark L., to American Optical Corporation. Apparatus and method for injection molding lenses. 4,540,534, Cl. 264-2.200.

Grenleski, Stephen E., Jr.: *See*—
Dale, Lawrence A.; Grenleski, Stephen E., Jr.; Keirsey, James L.; and Stevens, Charles E., 4,539,811, Cl. 60-270.100.

Gresley, Ross A.; Leech, Howard E.; and Smock, Alan L., to General Motors Corporation. Solenoid coil wire termination. 4,540,962, Cl. 335-131.000.

Greth, Erich, to Lonza, Ltd. Process for the preparation of 4-alkoxyacetoacetic acid ester. 4,540,808, Cl. 560-178.000.

Gries, Josef: *See*—
Franke, Albrecht; Muller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Gunther; Muller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,540,697, Cl. 514-255.000.

Griesser, Walter: *See*—
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Grim, James W.: *See*—
Todhunter, Gordon R.; and Grim, James W., 4,539,928, Cl. 116-34.00R.

Grimes, Patrick G., to Exxon Research & Engineering Company. Method and apparatus for maintaining the pH in zinc-bromine battery systems. 4,540,639, Cl. 429-17.000.

Grimmer, Paul D.: *See*—
Swiatosz, Edmund; Grimmer, Paul D.; and Sciascia, Rocco M., 4,539,986, Cl. 128-205.130.

Grindstaff, Quirinus G.: *See*—
Pavelka, Edwin A.; Grindstaff, Quirinus G.; and Scheppele, Stuart E., 4,540,304, Cl. 403-12.000.

Griz, Peter R. Bowstring-held archery device. 4,539,970, Cl. 124-90.000.

Grogler, Gerhard: *See*—
Rasshofer, Werner; Grogler, Gerhard; Konig, Klaus; and Dieterich, Dieter, 4,540,720, Cl. 521-159.000.

Grollier, Jean F., to L'Oreal. Cleaning product for the hair and skin, based on acylisethionates, cationic polymers and salts of fatty acid/-polypeptide condensates. 4,540,507, Cl. 252-174.230.

Gross, Rainer: *See*—
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Grossman, Robert J., to United States of America, Energy. High resolution in situ ultrasonic corrosion monitor. 4,539,846, Cl. 73-579.000.

Grote & Hartmann GmbH & Co. KG: *See*—
Konnemann, Alfred; and Ehrenberg, Jorgen, 4,540,234, Cl. 339-259.00R.
Lolic, Srboslav, 4,540,235, Cl. 339-259.00F.

Grove, L. W., Jr. Meter vault cover with externally visible register. 4,539,844, Cl. 73-201.000.

Grove Valve and Regulator Company: *See*—
Ledeen, Howard L.; and Ledeen, William P., 4,540,025, Cl. 137-625.320.

Grube, Kenneth E.; Harrington, Vincent E.; and Harrington, James V. Method for fragmenting municipal solid wastes. 4,540,467, Cl. 162-4.000.

Grumman Aerospace Corporation: *See*—
Faraci, Arthur, 4,540,227, Cl. 339-17.00F.
Mihelich, Peter, 4,540,029, Cl. 140-92.200.

Gryaznov, Mikhail I.: *See*—
Musin, Rafail M.; Gryaznov, Mikhail I.; Timofeev, Dmitry A.; Filatov, Nikolai Y.; and Andreeva, Tamara S., 4,541,070, Cl. 364-900.000.

GTE Communications Products Corporation: *See*—
McDonald, Robert C.; Wang, Wei-Tao; Cukor, Peter; and Rubner, Michael F., 4,540,641, Cl. 429-105.000.

GTE Laboratories Incorporated: *See*—
McDonald, Robert C.; Wang, Wei-Tao; Cukor, Peter; and Rubner, Michael F., 4,540,641, Cl. 429-105.000.

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Rothwell, Harold L.; and English, George J., 4,540,373, Cl. 445-22.000.

Guba, Galina Y.: *See*—
Chuiko, Alexei A.; Morev, Anatoly V.; Golovkov, Alexandr S.; Smirnov, Valentin A.; Voronin, Evgeny F.; Evlakhova, Raisa A.; Guba, Galina Y.; Slushnene, Iolita R.; Pasvyanskas, Arunas V.; and Sushko, Roman V., 4,540,652, Cl. 430-84.000.

Guell, Mario R., to Tri-Saver Corporation. Gas saving apparatus. 4,539,966, Cl. 123-557.000.

Guest, Alice Hamilton: *See*—
Hamilton, Lyman L., 4,539,774, Cl. 43-80.000.

Gulick, Michael H.: *See*—
Madonio, Andrew M.; and Gulick, Michael H., 4,539,775, Cl. 49-255.000.

Gunderson, Charles; and Kapadya, Aftab H., to Sanders Associates, Inc. Plotter pen. 4,540,993, Cl. 346-139.00R.

Gutman, Arnold D.: *See*—
Hsu, Joanna K.; and Gutman, Arnold D., 4,540,429, Cl. 71-90.000.

Gutmann, Paul F.; and Holm, Donald R. Ferrosilicon aggregate for concrete and resins. 4,540,438, Cl. 106-97.000.

Gutschmit, Alan, to Alandale Knitting Company. Textile yarn creel. 4,540,138, Cl. 242-131.000.

Haas, Peter; Avar, Geza; and Grammes, Hartwig, to Bayer AG. Polyhydroxyalkyl polycarbonamides for the production of flame-resistant polyurethane rigid foams and integral foams. 4,540,626, Cl. 428-318.800.

Habermehl, Robert, to Mobile Companies Inc. Method of using spent cracking catalyst as a waste material absorbant. 4,539,761, Cl. 34-9.000.

Habock, Wilhelm, to Papierfabrik Laakirchen Aktiengesellschaft. Foil package for paper handkerchiefs or tissues. 4,540,091, Cl. 206-494.000.

Habu, Nobuo, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for optimized gear shifting indication. 4,539,868, Cl. 74-864.000.

Hackett, Anthony M.: *See*—
Croxford, George A.; and Hackett, Anthony M., 4,540,011, Cl. 137-15.000.

Haegeman, Johny H. Apparatus for mixing gas and liquid. 4,540,528, Cl. 261-91.000.

Haer, Richard L. Drainpipe strainer. 4,539,718, Cl. 4-292.000.

Haerther, William W.; and Hartz, T. Jayes, to Ideal Carbide Die Co. Alignment tooling for metal cylinder welding machines. 4,540,879, Cl. 219-61.300.

Hag GF Aktiengesellschaft: *See*—
Vitzthum, Otto G.; Werkhoff, Peter; and Gehrig, Manfred, 4,540,784, Cl. 544-274.000.

Haga, Shozi: *See*—
Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, 4,539,859, Cl. 74-475.000.

Hagedorn, Ferdinand: *See*—
Behre, Horst; Blank, Heinz U.; Seyberlich, Alfred; and Hagedorn, Ferdinand, 4,540,817, Cl. 564-218.000.

Hagen, Michael S.: *See*—
Sutton, Steven R.; Hagen, Michael S.; Chapman, David D.; Gombert, Glenn S.; and Palmquist, Steven R., 4,541,100, Cl. 375-10.000.

Hagenlocher, Walter; Rapp, Lutz; Eschen, Werner; Ragaly, Istvan; Scharpf, Heinz; Streller, Jorg; Weigand, Johann; and Winkler, Klaus, to Robert Bosch GmbH. Alternator-rectifier unit with economical connections to wires embedded in a circuit board. 4,540,907, Cl. 310-68.00D.

Hagiwara, Hiroshi; Shirasaka, Masaru; and Nagayama, Hajime, to Onoda Cement Co., Inc. Desulfurizing agent. 4,540,553, Cl. 423-230.000.

Hagiwara, Isamu, to Omron Tateisi Electronics Co. System for performing combined financial transactions with single dispensing of cash. 4,541,057, Cl. 364-408.000.

Hagiwara, Naoki: *See*—
Shinkai, Kouki; Hagiwara, Naoki; and Nakano, Masaki, 4,540,915, Cl. 313-486.000.

Hahn, Steven, to Regulation Technology, Inc. Variable transformer and voltage control system. 4,540,931, Cl. 323-264.000.

Hait, Paul W., to Pyromid, Inc. Portable outdoor cooking unit with device for extinguishing the flame of canned jelly alcohol and the like. 4,539,973, Cl. 126-43.000.

Halcon SD Group, Inc., The: *See*—
Rizkalla, Nabil, 4,540,811, Cl. 560-233.000.

Haldor Torsoe A/S: *See*—
Pedersen, Karsten; Rostrup-Nielsen, Jens R.; Jorgensen, Ib Greve H.; and Andersen, Kjeld J., 4,540,714, Cl. 518-714.000.

Hall, Arlis: *See*—
Cataldo, Roy S.; and Hall, Arlis, 4,540,388, Cl. 474-242.000.

Hall, Wilbur L.: *See*—
Huang, Wann-Sheng; Gassmann, Zean Z.; Hawkins, Jeffrey T.; Schievelbein, Vernon H.; and Hall, Wilbur L., 4,540,050, Cl. 166-272.000.

Halliday, John J. Digital display apparatus. 4,539,768, Cl. 40-447.000.

Hallot, Andre : *See*—
Biziere, Kathleen; Hallot, Andre ; and Kan, Jean-Paul, 4,540,696, Cl. 514-254.000.

Halverstadt, Dale A.: *See*—
Cantrell, Daniel V.; and Halverstadt, Dale A., 4,540,005, Cl. 131-336.000.

Ham, Nancy M., to Ciba-Geigy Corporation. Diethyl toluene diamine hardener systems. 4,540,750, Cl. 525-504.000.

Hamada, Hideo: *See*—
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,539,869, Cl. 74-866.000.

Hamamoto, Yoshito: *See*—
Shibata, Setsuo; Koshiba, Yukihiko; Hamamoto, Yoshito; Kugai, Katsutoshi; Kawashima, Akiro; and Fujisawa, Hiroshi, 4,540,490, Cl. 210-323.200.

Hamill, Timothy: *See*—
Kopacz, Robert F.; and Hamill, Timothy, 4,540,368, Cl. 434-276.000.

Hamilton, Lyman L., to Guest, Alice Hamilton; Hamilton, Robert Lyman; and Hamilton, Neil Wesley. Rodent exterminator. 4,539,774, Cl. 43-80.000.

Hamilton, Neil Wesley: *See*—
Hamilton, Lyman L., 4,539,774, Cl. 43-80.000.

Hamilton, Robert Lyman: *See*—
Hamilton, Lyman L., 4,539,774, Cl. 43-80.000.

Hampton, Joe B., to Phillips Petroleum Company. Control of the concentration of methylacetylene and propadiene in a propylene/-propane fractionation column. 4,540,422, Cl. 62-21.000.

Hanafin, Joseph W.: *See*—
Doorakian, George A.; and Hanafin, Joseph W., 4,540,823, Cl. 568-10.000.

Hancock, Herbert W.: *See*—
Brockwell, Ian P.; and Hancock, Herbert W., 4,539,902, Cl. 99-454.000.

Hanisch, Horst: *See*—
Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; van der Maas, Hendrikus; and Suerken, Hans-Peter. 4,540,777, Cl. 536-102.000.

Hanna, George D., to Continental Electronics Mfg. Co. Amplitude modulator forms two phase-shifted pulse trains and combines them. 4,540,957, Cl. 332-10.000.

Hannon, Betty R.; Reusser, Fritz; Dolak, Lester A.; Argoudelis, Alexander D.; and Castle, Thomas M., to Upjohn Company, The. Composition of matter and process. 4,540,661, Cl. 435-42.000.

Hansen, Floyd D.: *See*—
Corrigall, Don J.; Hansen, Floyd D.; and Kujawa, James R., 4,540,871, Cl. 219-137.630.

Hansen, Willi: *See*—
Berstein, Garri; Hansen, Willi; and Winkens, Rudolf, 4,539,831, Cl. 72-110.000.

Hanson, Steven P.: *See*—
Rehkemper, Steven F.; Hanson, Steven P.; and Disko, Harry, 4,540,377, Cl. 446-430.000.

Hansson, Erik G. Attachment device. 4,540,309, Cl. 403-374.000.

Happel, Friedrich; and Heller, Gunter, to F. Happel Tief-und Strassenbau GmbH. Apparatus for feeding bulk material, such as sand. 4,540,327, Cl. 414-352.000.

Haque, Yasuf A., to American Microsystems, Inc. Reference voltage circuit including a three-terminal operational amplifier with offset compensation. 4,540,949, Cl. 330-85.000.

Hara, Masato: *See*—
Hoshika, Shuji; Ishiai, Hideyuki; Nishikawa, Yukiyasu; Hara, Masato; Aitra, Hirochika; Okamoto, Ikuzo; and Shindow, Osamu, 4,540,253, Cl. 351-211.000.

Hara, Seinosuke; Miisho, Kazuyuki; Matsumoto, Yasuo; and Yoshikawa, Yasuo, to Nissan Motor Co., Ltd. Variable valve timing mechanism. 4,539,951, Cl. 123-90.170.

Hara, Shigeo: *See*—
Hattori, Masaichi; Hara, Shigeo; and Manabe, Shunichi, 4,540,965, Cl. 335-259.000.

Harada, Haruo; Fujiwara, Akira; Hatanaka, Yoshio; and Iimura, Hironori, to Myojo Foods Co., Ltd. Process for producing rapid-cooking pastas having good keeping quality. 4,540,590, Cl. 426-324.000.

Harada, Susumu; Shimizu, Kiyoshi; and Serizawa, Hajime, to Nitto Boseki Co. Ltd. Process for producing polymers of monoallylamine. 4,540,760, Cl. 526-211.000.

Harada, Susumu: *See*—
Honda, Masakazu; Harada, Susumu; and Kobayashi, Akio, 4,541,050, Cl. 364-424.000.

Haraguchi, Hiroshi; Narita, Ko; and Iwata, Toshiharu, to Nippondenso Co., Ltd. Ignition timing control system for internal combustion engines. 4,539,957, Cl. 123-425.000.

Harding, James H., to General Electric Company. Method for making plastic articles from resin. 4,540,541, Cl. 264-328.200.

Hardman, Harley F.; and Beach, Ronald I., to Standard Oil Company, The. Preparation of alcohols from synthesis gas. 4,540,713, Cl. 518-713.000.

Hardy, George W.; Lowe, Lawrence A.; and Smith, Terence W., to Burroughs Wellcome Co. Pharmaceutical peptides, preparation, use and intermediates. 4,540,682, Cl. 514-18.000.

Hareyama, Satoshi: *See*—
Kawanishi, Toshio; and Hareyama, Satoshi, 4,540,617, Cl. 428-137.000.

Harnischfeger Corporation: *See*—
Wadsworth, Charles; and Juergens, Dieter, 4,540,097, Cl. 212-196.000.

Harrington, David W.: *See*—
David, Gary L.; and Harrington, David W., 4,540,086, Cl. 198-536.000.

Harrington, James V.: *See*—
Grube, Kenneth E.; Harrington, Vincent E.; and Harrington, James V., 4,540,467, Cl. 162-4.000.

Harrington, Vincent E.: *See*—
Grube, Kenneth E.; Harrington, Vincent E.; and Harrington, James V., 4,540,467, Cl. 162-4.000.

Harris, Dewey F.: *See*—
Iversen, Ralph; and Harris, Dewey F., 4,540,230, Cl. 339-89.00M.

Harris, Marion K. Single acting steam engine. 4,539,894, Cl. 92-138.000.

Hart, Donald J.: *See*—
Short, William T.; Ottaviani, Robert A.; and Hart, Donald J., 4,540,734, Cl. 524-507.000.

Harte, Richard A.; Chen, Anthony B.; and Kaufman, Nancy K., to Daryl Laboratories, Inc. Substrate for fluoroimmunoassay of biological fluids. 4,540,660, Cl. 435-7.000.

Hartman, Robert L.: *See*—
Anthony, Philip J.; Hartman, Robert L.; Koszi, Louis A.; and Schwartz, Bertram, 4,539,743, Cl. 29-576.00B.

Hartner, Hartmut: *See*—
Klug, Rudolf; Hartner, Hartmut; Merrem, Hans-Joachim; and Neisius, Karl H., 4,540,650, Cl. 430-281.000.

Hartz, T. Jayes: *See*—
Haerther, William W.; and Hartz, T. Jayes, 4,540,879, Cl. 219-61.300.

Haruch, James, to Spraying Systems Co. Rotary disc atomizer. 4,540,124, Cl. 239-223.000.

Harvey, Donald M., to Eastman Kodak Company. Energy-saving electronic flash apparatus. 4,540,265, Cl. 354-417.000.

Harvey Hubbell Incorporated: *See*—
Himmelberger, John E.; and Scharf, James O., 4,539,739, Cl. 29-564.100.

Hasegawa, Junzo; Ogura, Masahiro; Kanema, Hiroshi; Kawaharada, Hajime; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo

Kabushiki Kaisha. Process for producing D-β-hydroxyalkanoic acid. 4,540,665, Cl. 435-146.000.

Hasegawa, Kenzi: *See*—
Sakakihara, Masahiko; Hasegawa, Kenzi; and Iwama, Akira, 4,540,638, Cl. 428-693.000.

Hasegawa, Toru: *See*—
Tanida, Seiichi; Muroi, Masayuki; and Hasegawa, Toru, 4,540,517, Cl. 260-239.30B.

Haselwarter, Klaus: *See*—
Schmidhammer, Ludwig; Dummer, Gerhard; Haselwarter, Klaus; and Strasser, Rudolf, 4,540,837, Cl. 570-211.000.

Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 4,540,851, Cl. 179-2.00A.

Hashimoto, Kazuo, to Hashimoto Corporation. Remote control device using telephone circuit of electric apparatus. 4,540,851, Cl. 179-2.00A.

Hashimoto, Tsutomu: *See*—
Nishi, Kazuro; Kurahashi, Koichiro; Hashimoto, Tsutomu; Senoo, Toshihiko; and Yamato, Shinji, 4,540,247, Cl. 350-3.710.

Hassel, Helmut; and Stark, Reimund, to Messerschmidt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung. Car bridging arrangement for high speed railway vehicles. 4,539,912, Cl. 105-8.00R.

Hassel, Karl D., Sr. Convertible seat for vehicles. 4,540,216, Cl. 297-238.000.

Hassler, John C.: *See*—
Genco, Joseph M.; and Hassler, John C., 4,540,468, Cl. 162-49.000.

Hatanaka, Masataka: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; Hatanaka, Masataka; Hirose, Masayoshi; and Kudo, Masaki, 4,540,706, Cl. 514-403.000.

Hatanaka, Yoshio: *See*—
Harada, Haruo; Fujiwara, Akira; Hatanaka, Yoshio; and Iimura, Hironori, 4,540,590, Cl. 426-324.000.

Hattori, Hideaki: *See*—
Yokoshima, Minoru; Nawata, Kazuyoshi; Ohkubo, Tetsuo; and Hattori, Hideaki, 4,540,809, Cl. 560-185.000.

Hattori, Kiyoshi; and Myers, John H., to El Paso Polyolefins Company. Heat-sterilizable polyolefin compositions and articles manufactured therefrom. 4,540,416, Cl. 604-410.000.

Hattori, Masaichi; Hara, Shigeo; and Manabe, Shunichi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electromagnetic assembly. 4,540,965, Cl. 335-259.000.

Hausberger, Arthur L.: *See*—
Kustes, William A.; and Hausberger, Arthur L., 4,540,681, Cl. 502-234.000.

Haut Fourneau et Fonderies de Cousances aux Forgers, S.A.: *See*—
Schmitt, Paul, 4,539,899, Cl. 99-347.000.

Hawkes, Michael A.: *See*—
Alba, Donald; and Hawkes, Michael A., 4,539,819, Cl. 62-78.000.

Hawkins, Jeffrey T.; and Gassmann, Zean Z., to Texaco Inc. Method of improving steam flood conformance with steam flooding agents without a non-condensable gas. 4,540,049, Cl. 166-272.000.

Hawkins, Jeffrey T.: *See*—
Huang, Wann-Sheng; Gassmann, Zean Z.; Hawkins, Jeffrey T.; Schievelbein, Vernon H.; and Hall, Wilbur L., 4,540,050, Cl. 166-272.000.

Hawrylo, Frank Z., to RCA Corporation. Flux-free photodetector bonding. 4,540,115, Cl. 228-123.000.

Hawrylo, Frank Z., to United States of America, Air Force. InP:Te Protective layer process for reducing substrate dissociation. 4,540,450, Cl. 148-171.000.

Hayashi, Asao; Aoki, Masahiro; Oinoue, Kenichi; and Ida, Masatoshi, to Olympus Optical Co., Ltd. Method of detecting focusing conditions. 4,540,881, Cl. 250-201.000.

Hayashi, Masaru: *See*—
Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; Furukawa, Osamu; Endo, Hiroshi; Hirao, Osamu; and Hayashi, Masaru, 4,540,971, Cl. 338-21.000.

Hayashi, Mikio; Kawasumi, Kouzi; and Kimura, Yoshinobu, to Nippondenso Co., Ltd. Side-mirror driving apparatus. 4,540,252, Cl. 350-634.000.

Haybuster Manufacturing, Inc.: *See*—
Morlock, Ruben D., 4,539,921, Cl. 111-52.000.

Hebert, Dellon. Retriever for submerged objects. 4,540,370, Cl. 441-9.000.

Hedelin, Lars G. B. Method of controlling the combustion cycle in a combustion engine. 4,539,946, Cl. 123-48.00A.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Allyl styryl pyridines and pyrazines and polymers thereof. 4,540,745, Cl. 525-401.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Allylated di or polycyclopentadiene diphenols. 4,540,829, Cl. 568-634.000.

Hege, Hans-Gunther: *See*—
Franke, Albrecht; Muller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Gunther; Muller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,540,697, Cl. 514-255.000.

Hehl, Edward M.: *See*—
Swartzbaugh, Peter T.; and Hehl, Edward M., 4,540,099, Cl. 215-252.000.

Heideman, Robert J.: *See*—
Stevens, Frederick G.; Heideman, Robert J.; and Holden, Jerry B., 4,539,769, Cl. 42-1.00A.

Heil, Eduard: *See*—
Pipper, Gunter; Schmidt, Franz; Theysohn, Rainer; Riegger, Siegfried; Heil, Eduard; Fischer, Hermann; Thoma, Richard; and Matthies, Paul, 4,540,772, Cl. 528-335.000.

Hein, Klaus R. G.: *See*—
Franke, Paul W. U.; Glaser, Wolfgang; Gebhard, Georg R. U.; and Hein, Klaus R. G., 4,540,555, Cl. 423-242.000.

Heinemann, Otto: *See*—
Ahrens, Norbert; Heinemann, Otto; Klockenbusch, Heinrich; and Kluger, Wolfgang, 4,539,782, Cl. 52-192.000.

Heinke, Dennis: *See*—
Clancy, Steven J.; Whatley, James F.; and Heinke, Dennis, 4,540,985, Cl. 343-5.0DP.

Heisler, Raymond A. Upstacker apparatus with biased gripping means. 4,540,325, Cl. 414-96.000.

Helbling, Gottfried, to Isaflex AG. Method for improving water retention qualities of soil and an agent for performing this method. 4,540,427, Cl. 71-27.000.

Heliotronic Forschungs-und Entwicklungsgesellshaft fur Solarzellen-Grundstoffe: *See*—
Ermer, Wolfgang; and Muhlbauer, Klemens, 4,539,972, Cl. 125-16.00R.

Helix Technology Corporation: *See*—
Holland, Noel J., 4,539,818, Cl. 62-6.000.

Heller, Gunter: *See*—
Happel, Friedrich; and Heller, Gunter, 4,540,327, Cl. 414-352.000.

Henderson, E. Webb; and Gravley, Mark L., to Phillips Petroleum Company. Carbon blacks. 4,540,560, Cl. 423-445.000.

Henderson, Herman O., Jr.: *See*—
Baugh, Benton F.; Henderson, Herman O., Jr.; and Fowler, John H., 4,540,053, Cl. 166-348.000.

Henderson, Scott R. Fold-up insulated beverage container holder. 4,540,611, Cl. 428-12.000.

Hendrickson, Larry L.: *See*—
Van Der Puy, Michael; Hendrickson, Larry L.; Kolc, Jaroslav F.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,540,428, Cl. 71-28.000.

Hengel, James F.; Armstrong, Donald J.; Ament, Frank; Center, Marc B.; and Ausen, John E., to General Motors Corporation. Diesel fuel injection pump with adaptive torque balance control. 4,539,956, Cl. 123-357.000.

Henk, Hermann; Kramer, Erich; Schundehutte, Karl H.; and Nickel, Horst, to Bayer Aktiengesellschaft. Reactive fluorotriazinylaminonaphthotriazolyphenylazopyridone or pyrimidone dyestuffs. 4,540,776, Cl. 534-635.000.

Henkel Corporation: *See*—
Karl, Curtis L., 4,540,510, Cl. 252-315.300.

Henriksen, Melvin S.; and Meyer, Richard C., to Beckman Instruments, Inc. Rotary sheer valve with wash and purge station. 4,540,015, Cl. 137-240.000.

Henry, George R.: *See*—
Stanley, Richard L.; and Henry, George R., 4,539,809, Cl. 60-39.094.

Hepp, Wolfgang: *See*—
Forssmann, Bernd; Hepp, Wolfgang; Hoff, Guenter; and Chaussy, Christian, 4,539,989, Cl. 128-328.000.

Herbig, Mark A.: *See*—
Johnson, John K.; Earhart, Jack R.; Astrom, Gordon L.; and Herbig, Mark A., 4,540,487, Cl. 210-264.000.

Herchenbach, Paul: *See*—
Geisthoff, Hubert; Vollmer, Jurgen; and Herchenbach, Paul, 4,540,305, Cl. 403-13.000.

Hercules Incorporated: *See*—
Johnson, John H., 4,540,756, Cl. 526-124.000.

Herlitz, John E.; and Cameron, Carl A., to Chrysler Corporation. Vehicle cargo organizer assembly. 4,540,213, Cl. 296-37.500.

Herr, Diane E.; Suk, Laddie E.; and Winchell, David F., to AT&T Bell Laboratories. Method and apparatus for controlling a conference. 4,540,850, Cl. 179-2.0DP.

Herten, Joris F. A.; and Devroede, Emile M., to Allied Corporation. Temporary protective coating composition of ethylene and acrylic acid and a base. 4,540,736, Cl. 524-556.000.

Hester, Benny L.; and Graves, William H., Jr., to R. J. Reynolds Tobacco Company. Package leak tester. 4,539,836, Cl. 73-49.300.

Heubach, Edward C., to Owens-Corning Fiberglas Corporation. Refractory electrode blocks with improved retaining means. 4,541,098, Cl. 373-36.000.

Heuser, Hans: *See*—
Brunion, Hans-Georg; Hiemenz, Christian; Heuser, Hans; and Radisch, Helmer, 4,540,622, Cl. 428-216.000.

Heymer, Gero: *See*—
Gradl, Reinhard; Stephan, Hans-Werner; Heymer, Gero; and Schimmel, Gunther, 4,540,558, Cl. 423-321.00R.

Hi-Shear Corporation: *See*—
Bochman, Harry L., Jr., 4,539,872, Cl. 81-57.370.

Hibino, Kunio: *See*—
Suzuki, Takashi; Hibino, Kunio; Murai, Mikio; Kawase, Shigeki; and Shinohara, Koichi, 4,540,618, Cl. 428-141.000.

Hidaka, Toshiyuki; Sakamoto, Hisashi; Fukuhara, Toshiaki; Fujieda, Sadao; and Misawa, Yutaka, to Hitachi, Ltd. Resin-molded semiconductor device and a process for manufacturing the same. 4,540,603, Cl. 427-82.000.

Hideki, Ono: *See*—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,540,704, Cl. 514-389.000.

Hiemenz, Christian: *See*—
Brunion, Hans-Georg; Hiemenz, Christian; Heuser, Hans; and Radisch, Helmer, 4,540,622, Cl. 428-216.000.

Higashiyama, Seiichi: *See*—
Komazawa, Hiroyasu; Hotta, Hiroshi; Nakatsuji, Hiroshi; Yoko, Kiyoshi; Higashiyama, Seiichi; Nakashima, Tuneyasu; and Gotoh, Noboru, 4,540,773, Cl. 528-480.000.
Higuchi, Kanji: *See*—
Kondo, Ryoji; Takamura, Kozo; and Higuchi, Kanji, 4,540,910, Cl. 313-11.500.
Hill, Dennis B., to Hill & Dunn Networks, Inc. Method for strengthening long chain synthetic polymer fibers. 4,540,609, Cl. 427-343.000.
Hill & Dunn Networks, Inc.: *See*—
Hill, Dennis B., 4,540,609, Cl. 427-343.000.
Hillsberry, Jerl D. Auxiliary mattress corners. 4,539,723, Cl. 5-504.000.
Hilti Aktiengesellschaft: *See*—
Rupprecht, Hans; and Hoyss, Franz, 4,540,149, Cl. 248-669.000.
Hilton-Davis Chemical Co., The: *See*—
Schmidt, Paul J.; and Hung, William M., 4,540,790, Cl. 546-283.000.
Hilvenna Limited: *See*—
Saxby, Michael E., 4,539,969, Cl. 124-57.000.
Himmelberger, John E.; and Scharf, James O., to Harvey Hubbell Incorporated. Apparatus for making armored electrical cable. 4,539,739, Cl. 29-564.100.
Hinman, P. Anthony, to Hitco. Reaction product of tungsten carbonyl/pyrrolidine complex with a furan acid. 4,540,764, Cl. 528-9.000.
Hino, Naganori: *See*—
Konishi, Hiroyuki; Hino, Naganori; Matsumoto, Hiroshi; and Yoshida, Ryo, 4,540,824, Cl. 568-45.000.
Hintzmann, Manfred: *See*—
Papenfuhs, Theodor; and Hintzmann, Manfred, 4,540,815, Cl. 564-216.000.
Hipko, George P., to Beatrice Foods, Co. Universal product code scannable coupon. 4,540,880, Cl. 235-487.000.
Hiraga, Masaharu: *See*—
Sakaki, Masakatsu; and Hiraga, Masaharu, 4,540,355, Cl. 418-55.000.
Hirano, Shigeo: *See*—
Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, 4,540,655, Cl. 430-410.000.
Hirao, Osamu: *See*—
Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; Furukawa, Osamu; Endo, Hiroshi; Hirao, Osamu; and Hayashi, Masaru, 4,540,971, Cl. 338-21.000.
Hirayama, Yoshio: *See*—
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; Kajiyama, Takashi; and Hotta, Kunihiko, 4,540,449, Cl. 148-31.500.
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Hirosaki, Botaro, to NEC Corporation. Framing circuit for digital system. 4,541,104, Cl. 375-114.000.
Hirose, Masayoshi: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; Hatanaka, Masataka; Hirose, Masayoshi; and Kudo, Masaki, 4,540,706, Cl. 514-403.000.
Hirsch, Martin; Fischer, Peter; and Serbent, Harry, to Metallgesellschaft Aktiengesellschaft. Continuous process of melting sponge iron. 4,540,432, Cl. 75-43.000.
Hitachi, Ltd.: *See*—
Fujii, Teruo; Fukushima, Hiroshi; and Nakai, Nobuo, 4,540,856, Cl. 179-89.000.
Hidaka, Toshiyuki; Sakamoto, Hisashi; Fukuhara, Toshiaki; Fujieda, Sadao; and Misawa, Yutaka, 4,540,603, Cl. 427-82.000.
Horikoshi, Tatsuo; Yonezawa, Seiji; Tsuyoshi, Toshiaki; Tooyama, Hiroshi; and Otake, Masatoshi, 4,541,082, Cl. 369-44.000.
Kogawa, Takashi, 4,541,060, Cl. 364-513.000.
Kuwabara, Kouji; Sasaki, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,541,097, Cl. 372-87.000.
Maeda, Takeshi; Uno, Motoo; and Takasago, Masahiro, 4,541,083, Cl. 369-44.000.
Maruyama, Masanori; Fukushima, Masakazu; Kato, Shinichi; and Ogusu, Chihaya, 4,540,916, Cl. 315-16.000.
Nagashima, Shigeo; Torii, Shunichi; Omoda, Koichiro; and Inagami, Yasuhiro, 4,541,046, Cl. 364-200.000.
Nishida, Masami; Nishimura, Keizo; Arai, Takao; and Amada, Nobutaka, 4,541,091, Cl. 371-39.000.
Oku, Masuo; Yamashita, Masami; Miura, Yoshio; and Suzuki, Motoyuki, 4,541,084, Cl. 369-45.000.
Otsuka, Kanji; Mitsusada, Kazumichi; Sekibata, Masao; and Ohnishi, Shinji, 4,541,003, Cl. 357-74.000.
Sakakihara, Masahiko; Hasegawa, Kenzi; and Iwama, Akira, 4,540,638, Cl. 428-693.000.
Shibuya, Yoshimichi; Takahashi, Masami; and Ishibashi, Tadashi, 4,540,242, Cl. 350-335.000.
Shinkai, Kouki; Hagiwara, Naoki; and Nakano, Masaki, 4,540,915, Cl. 313-486.000.
Takeda, Yukio; Ogihara, Satoru; Ura, Mitsuru; Nakamura, Kousuke; Asai, Tadamichi; Ohkoshi, Tokio; Matsushita, Yasuo; and Maeda, Kunihiro, 4,540,673, Cl. 501-96.000.
Wada, Kenichi; Shintani, Yooichi; Shimizu, Tsuguo; and Yamaoka, Akira, 4,541,047, Cl. 364-200.000.
Hitachi Metals, Ltd.: *See*—
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Watanabe, Nobuyuki; and Wanda, Nobuo, 4,540,205, Cl. 285-329.000.
Hitco: *See*—
Hinman, P. Anthony, 4,540,764, Cl. 528-9.000.
Hitec Co., Ltd.: *See*—
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Hitzman, Donald O., to Phillips Petroleum Company. Generation of microorganism control composition and use thereof. 4,540,052, Cl. 166-303.000.
Hoch, John J., to Deere & Company. Static discharge prevention system for a largely non-metallic fuel tank. 4,540,191, Cl. 280-5.00A.
Hodes, Erich: *See*—
Wegner, Karl-Heinz; Hodes, Erich; and Mann, Horst, 4,540,630, Cl. 428-408.000.
Hodge, Raymond P., to Ram Corporation. Chin operated shield and welding hood. 4,539,713, Cl. 2-8.000.
Hodgin, John B.: *See*—
Conklin, Delano M.; Hodgin, John B.; and Illman, Walter F., 4,540,610, Cl. 427-434.500.
Hodgkins, Charles E.: *See*—
Chu, Mike S. H.; Hodgkins, Charles E.; and Rose, Daniel C., 4,540,676, Cl. 501-138.000.
Hoechst Aktiengesellschaft: *See*—
Arndt, Otto; and Papenfuhs, Theodor, 4,540,832, Cl. 568-711.000.
Gradl, Reinhard; and Schimmel, Gunther, 4,540,557, Cl. 423-321.00R.
Gradl, Reinhard; Stephan, Hans-Werner; Heymer, Gero; and Schimmel, Gunther, 4,540,558, Cl. 423-321.00R.
Moser, Hermann, 4,540,267, Cl. 355-3.0FU.
Papenfuhs, Theodor; and Hintzmann, Manfred, 4,540,815, Cl. 564-216.000.
Scheler, Siegfried, 4,540,648, Cl. 430-172.000.
Sommer, Karl; and Schickfluss, Rudolf, 4,540,816, Cl. 564-218.000.
Hoene, Ernst-Ludwig: *See*—
Bettge, Hans; Bialkowski, Gunther; and Hoene, Ernst-Ludwig, 4,540,863, Cl. 200-144.00B.
Hoff, Guenter: *See*—
Forssmann, Bernd; Hepp, Wolfgang; Hoff, Guenter; and Chaussy, Christian, 4,539,989, Cl. 128-328.000.
Hoffart, Dean. Guitar. 4,539,886, Cl. 84-267.000.
Hoffmeister, Friedrich: *See*—
Mardin, Mithat; Busse, Wolf-Dieter; Hoffmeister, Friedrich; Seuter, Friedel; Perzborn, Elisabeth; Schlossmann, Klaus; Mayer, Dieter; and Fiedler, Volker, 4,540,707, Cl. 514-404.000.
Hofmaier, Gerhard: *See*—
Gehring, Fritz; and Hofmaier, Gerhard, 4,540,028, Cl. 139-453.000.
Holan, George; and Walser, Reimund A., to Commonwealth Scientific and Industrial Research Organization, The. Insecticidal ester enantiomers. 4,540,710, Cl. 514-521.000.
Holden, Jerry B.: *See*—
Stevens, Frederick G.; Heideman, Robert J.; and Holden, Jerry B., 4,539,769, Cl. 42-1.00A.
Hollaender Manufacturing Co., The: *See*—
Hollaender, Robert P., II; Howard, Leslie M.; and Hund, Ernest A., 4,540,307, Cl. 403-190.000.
Hollaender, Robert P., II; Howard, Leslie M.; and Hund, Ernest A., to Hollaender Manufacturing Co., The. Fitting for structural pipe. 4,540,307, Cl. 403-190.000.
Holland, Noel J., to Helix Technology Corporation. Refrigerator with a clearance seal compressor. 4,539,818, Cl. 62-6.000.
Hollister Incorporated: *See*—
Nystrom, Wilford O.; Riedel, Kenneth E.; and Doerschner, David L., 4,540,409, Cl. 604-349.000.
Holloway, Clifford C., to Holloway, Lewis B.; and Holloway, Winford B., part interest to each. Process for treating municipal solid waste. 4,540,495, Cl. 210-774.000.
Holloway, Lewis B.: *See*—
Holloway, Clifford C., 4,540,495, Cl. 210-774.000.
Holloway, Winford B.: *See*—
Holloway, Clifford C., 4,540,495, Cl. 210-774.000.
Holm, Donald R.: *See*—
Gutmann, Paul F.; and Holm, Donald R., 4,540,438, Cl. 106-97.000.
Holzle, Gerd: *See*—
Eckhardt, Claude; and Holzle, Gerd, 4,540,518, Cl. 260-242.200.
Honchar, Dennis R.: *See*—
Geary, David F.; Honchar, Dennis R.; and Miller, Robert P., 4,540,637, Cl. 428-626.000.
Honda Giken Kogyo K.K.: *See*—
Nakajima, Toyohei; and Tomono, Kiyohisa, 4,539,967, Cl. 123-585.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kashiwai, Mikio, 4,540,062, Cl. 180-227.000.
Noda, Azusa; Fujitaka, Nobuo; and Fujisaki, Masaru, 4,540,193, Cl. 280-284.000.
Tanaka, Hiroshi; Sugisaki, Mutuo; and Itoh, Kazuhiro, 4,539,895, Cl. 92-249.000.
Tanaka, Norio, 4,540,189, Cl. 280-270.000.
Tomita, Takao; Tottori, Takumi; Terada, Yasuo; Toyota, Hideki; and Akiba, Masahiro, 4,539,813, Cl. 60-314.000.
Yamamoto, Kuniyuki; and Ohyama, Kazuo, 4,540,077, Cl. 192-70.120.
Honda, Masakazu; Harada, Susumu; and Kobayashi, Akio, to Nippondenso Co., Ltd. Control device for a vehicle. 4,541,050, Cl. 364-424.000.
Honda, Nobuyasu; Matsui, Toshikazu; Fushida, Akira; Ikeda, Toshimitsu; Takahashi, Kenji; Fukuda, Hideo; Kamezaki, Yasushi; and Teshima, Takashi, to Mita Industrial Co Ltd. Magnetic brush development method. 4,540,645, Cl. 430-122.000.

Honeywell Lucifer SA: *See—*
Jungen, Hans-Ulrich, 4,540,158, Cl. 251-367.000.
Hooven, Michael D., to Cordis Corporation. Non-invasively adjustable valve. 4,540,400, Cl. 604-9.000.
Hopf, Reinhard; and Longchamp, Jean-Francois, to Blaupunkt-Werke GmbH. Circuit for automatic selection between speech and music sound signals. 4,541,110, Cl. 381-46.000.
Hopkins, David E., Jr. Body attached elastic type exercising device. 4,540,173, Cl. 272-139.000.
Hopkins, Thomas R., to Phillips Petroleum Company. Alcohol oxidase from Pichia-type yeasts. 4,540,668, Cl. 435-190.000.
Hori, Katsuya: *See—*
Furuya, Tsuneo; and Hori, Katsuya, 4,541,093, Cl. 371-40.000.
Horiguchi, Satoru; and Amemiya, Shinichi, to Dai Nippon Insatsu Kabushiki Kaisha. Device for testing a resist layer on a gravure printing plate. 4,539,839, Cl. 73-73.000.
Horikoshi, Tatsuo; Yonezawa, Seiji; Tsuyoshi, Toshiaki; Tooyama, Hiroshi; and Otake, Masatoshi, to Hitachi, Ltd. Device for optically tracking information. 4,541,082, Cl. 369-44.000.
Horn, Alan S., to Nelson Research & Development Co. Dopamine agonists and use thereof. 4,540,691, Cl. 514-211.000.
Horn, William H.: *See—*
Sugama, Toshifumi; Kukacka, Lawrence E.; and Horn, William H., 4,540,726, Cl. 523-505.000.
Hornung, Friedrich; and Schadlich, Fritz, to Robert Bosch, GmbH. Rotary electrical tool with speed control, especially drill. 4,540,318, Cl. 408-9.000.
Horowitz, Bernard: *See—*
Neurath, Alexander R.; and Horowitz, Bernard, 4,540,573, Cl. 424-85.000.
Horvath, Joseph G.; and Miller, James C., to Automeg, Inc. Motor winding leakage monitor. 4,540,922, Cl. 318-490.000.
Horvath, Richard L., to United States of America, Air Force. One-piece HPTR blade squealer tip. 4,540,339, Cl. 416-92.000.
Horvath, Tibor. Puzzle cube. 4,540,177, Cl. 273-153.00S.
Hosaka, Yukio: *See—*
Satake, Toshihiko; and Hosaka, Yukio, 4,540,286, Cl. 356-445.000.
Hoshika, Shuji; Ishiai, Hideyuki; Nishikawa, Yukiyasu; Hara, Masato; Aiura, Hirochika; Okamoto, Ikuzo; and Shindow, Osamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Method and device for measuring eye refraction errors. 4,540,253, Cl. 351-211.000.
Hotpoint Limited: *See—*
Croxford, George A.; and Hackett, Anthony M., 4,540,011, Cl. 137-15.000.
Hotta, Hiroshi: *See—*
Komazawa, Hiroyasu; Hotta, Hiroshi; Nakatsuji, Hiroshi; Yoko, Kiyoshi; Higashiyama, Seiichi; Nakashima, Tuneyasu; and Gotoh, Noboru, 4,540,773, Cl. 528-480.000.
Hotta, Kunihiko: *See—*
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; Kajiyama, Takashi; and Hotta, Kunihiko, 4,540,449, Cl. 148-31.500.
Hoult, David P. Gas-lubricated seal for sealing between a piston and a cylinder wall. 4,540,185, Cl. 277-174.000.
Houminer, Yoram. *See—*
Podraza, Kenneth F.; and Houminer, Yoram, 4,540,004, Cl. 131-277.000.
House Food Industrial Company Limited: *See—*
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,539,903, Cl. 99-470.000.
Houssian, Vazgen J.: *See—*
Dowzall, Martin E.; and Houssian, Vazgen J., 4,539,759, Cl. 33-184.500.
Howard, Leslie M.: *See—*
Hollaender, Robert P., II; Howard, Leslie M.; and Hund, Ernest A., 4,540,307, Cl. 403-190.000.
Howells, Richard D.: *See—*
Chang, John C.; and Howells, Richard D., 4,540,497, Cl. 252-8.800.
Hoxan Corporation: *See—*
Kuraoka, Yasuo; and Sakao, Nobuo, 4,539,824, Cl. 62-380.000.
Hoya Lens Corporation: *See—*
Kawamura, Kazunori; Yamashita, Shinichi; Yokoyama, Yuichi; and Tsuchiya, Makoto, 4,540,761, Cl. 526-245.000.
Hoyss, Franz: *See—*
Rupprecht, Hans; and Hoyss, Franz, 4,540,149, Cl. 248-669.000.
Hsu, Joanna K.; and Gutman, Arnold D., to Stauffer Chemical Company. 4-Phenyl-1,2,3-thiadiazoles as herbicide extenders. 4,540,429, Cl. 71-90.000.
Huang, Wann-Sheng; Gassmann, Zean Z.; Hawkins, Jeffrey T.; Schievelbein, Vernon H.; and Hall, Wilbur L., to Texaco Inc. Method of improving conformance in steam floods with steam foaming agents. 4,540,050, Cl. 166-272.000.
Hubbard, Charles R.: *See—*
Baughman, Richard C.; Bump, David S.; and Hubbard, Charles R., 4,540,458, Cl. 156-312.000.
Hubel, Egon, to Schering Aktiengesellschaft. Device for the fine adjustment of the output voltage of multi-phase regulating transformers. 4,540,934, Cl. 323-341.000.
Huber, Rudolph F.: *See—*
Durno, Ronald A.; and Huber, Rudolph F., 4,540,141, Cl. 244-17.190.
Huck Manufacturing Company: *See—*
Mercer, Larry D., 4,540,447, Cl. 148-2.000.
Hughes Aircraft Company: *See—*
Propster, John A.; and Rowan, John H., 4,541,048, Cl. 364-200.000.
Sashital, Sanat K.; Joyce, Robert L.; and Gentile, Anthony L., 4,540,461, Cl. 156-624.000.
Sherwood, Charles H., 4,540,625, Cl. 428-283.000.
Sugar, Joseph, 4,540,969, Cl. 337-232.000.
Hughes, Walton: *See—*
Stanner, Donald; and Hughes, Walton, 4,540,331, Cl. 414-730.000.
Hukaya, Toshio: *See—*
Ishizawa, Akio; Hukaya, Toshio; Kumagai, Katuya; and Takeuchi, Tatuo, 4,540,627, Cl. 428-328.000.
Humphrey Instruments, Inc.: *See—*
Humphrey, William E., 4,540,254, Cl. 351-212.000.
Humphrey, William E., to Humphrey Instruments, Inc. Keratometer having peripheral light entrance and exit paths. 4,540,254, Cl. 351-212.000.
Hund, Ernest A.: *See—*
Hollaender, Robert P., II; Howard, Leslie M.; and Hund, Ernest A., 4,540,307, Cl. 403-190.000.
Hung, William M.: *See—*
Schmidt, Paul J.; and Hung, William M., 4,540,790, Cl. 546-283.000.
Hunt, Richard B.; Dancy, William B.; and Alexander, James B., to International Minerals & Chemical Corp. Dynamate II mineral nutrition supplement. 4,540,577, Cl. 424-153.000.
Hunter, William L.; and Theobald, Paul R., to Motorola, Inc. Self-positioning heat spreader. 4,541,005, Cl. 357-81.000.
Hunter's Specialties, Inc.: *See—*
Forbes, David R.; and Forbes, Carman S., 4,539,772, Cl. 43-3.000.
Hwang, San-Bao: *See—*
Chang, Michael N.; and Hwang, San-Bao, 4,540,709, Cl. 514-470.000.
Hydra Systems International, Inc.: *See—*
Stevens, Frederick G.; Heideman, Robert J.; and Holden, Jerry B., 4,539,769, Cl. 42-1.00A.
Hyeong-Woon, Shin. Portable knife equipped with a spoon and a fork. 4,539,749, Cl. 30-147.000.
Hyodo, Hitoshi: *See—*
Kawata, Shoji; Hyodo, Hitoshi; and Akita, Tokihiko, 4,540,060, Cl. 180-179.000.
Iacampo, Marco: *See—*
Mallok, Horst; Brown, Howard; and Iacampo, Marco, 4,540,478, Cl. 204-297.00W.
Iacovangelo, Charles D.; and Browall, Kenneth W., to United States of America, Energy. Coated powder for electrolyte matrix for carbonate fuel cell. 4,540,640, Cl. 429-41.000.
Ibbetson, David N. I., to Moore, Derek W. Loop fault isolator. 4,541,031, Cl. 361-67.000.
Ibiden Kabushiki Kaisha: *See—*
Enomoto, Ryo; and Tsukada, Kiyotaka, 4,540,677, Cl. 501-151.000.
Ida, Masatoshi: *See—*
Hayashi, Asao; Aoki, Masahiro; Oinoue, Kenichi; and Ida, Masatoshi, 4,540,881, Cl. 250-201.000.
Ideal Carbide Die Co.: *See—*
Haerther, William W.; and Hartz, T. Jayes, 4,540,879, Cl. 219-61.300.
Ifield Engineering Pty. Limited: *See—*
Frazer, Hugh I., 4,540,221, Cl. 308-5.00R.
Frazer, Hugh I., 4,540,345, Cl. 417-269.000.
Igarashi, Taisei: *See—*
Inaba, Yukio; Igarashi, Taisei; Tahara, Susumu; and Miyatake, Takashi, 4,540,800, Cl. 549-462.000.
Igarashi, Tatsushi: *See—*
Arai, Tetsuji; and Igarashi, Tatsushi, 4,540,911, Cl. 313-44.000.
Iglehart, T. R.: *See—*
Wharton, E. B.; and Iglehart, T. R., 4,540,420, Cl. 55-181.000.
Ihm, Gerald J.: *See—*
Roeth, Kenneth M.; and Ihm, Gerald J., 4,540,220, Cl. 301-125.000.
Iida, Noboru: *See—*
Ishikawa, Katsutoshi; Shimotori, Hitoshi; Iida, Noboru; Akihiro, Kazuo; and Ozawa, Shuji, 4,540,698, Cl. 514-270.000.
Iimura, Hironori: *See—*
Harada, Haruo; Fujiwara, Akira; Hatanaka, Yoshio; and Iimura, Hironori, 4,540,590, Cl. 426-324.000.
Ikawa, Kazuo: *See—*
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, 4,540,059, Cl. 180-141.000.
Ikeda, Toshimitsu: *See—*
Honda, Nobuyasu; Matsui, Toshikazu; Fushida, Akira; Ikeda, Toshimitsu; Takahashi, Kenji; Fukuda, Hideo; Kamezaki, Yasushi; and Teshima, Takashi, 4,540,645, Cl. 430-122.000.
Illman, Walter F.: *See—*
Conklin, Delano M.; Hodgin, John B.; and Illman, Walter F., 4,540,610, Cl. 427-434.500.
Im, Jang-hi; and Shrum, William E., to Dow Chemical Company, The. Coextruded multi-layered articles. 4,540,623, Cl. 428-220.000.
Imada, Kunihiko: *See—*
Otake, Katsumasa; Omura, Takashi; Kayane, Yutaka; and Imada, Kunihiko, 4,540,418, Cl. 8-524.000.
Imai, Kazuhiro; Zenzo, Tamura; and Shin-Ichiro, Kobayashi, to Yamanouchi Pharmaceutical Co., Ltd. Method of detecting fluorescent materials and apparatus for their detection. 4,540,548, Cl. 422-52.000.
Imai, Motomasa: *See—*
Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; Furukawa, Osamu; Endo, Hiroshi; Hirao, Osamu; and Hayashi, Masaru, 4,540,971, Cl. 338-21.000.
Imaizumi, Mamoru; and Kuzuya, Susumu, to Brother Kogyo Kabushiki Kaisha. Paper holding, feeding and inserting apparatus for a printer using different kinds of sheets. 4,540,297, Cl. 400-625.000.

Imanaka, Yoshiaki; and Kinashi, Hiroshi, to Sharp Kabushiki Kaisha. Electrophotographic copying machine with a pre-copy system. 4,540,270, Cl. 355-3.00R.
IMC Magnetics Corp.: *See*—
Manson, Harry G., 4,539,745, Cl. 29-596.000.
Imperial Chemical Industries PLC: *See*—
Chinchen, Godfrey C., 4,540,563, Cl. 423-656.000.
Imperial Clevite Inc.: *See*—
Kolchinsky, Abel E.; and Kazi, Shaukat, 4,540,154, Cl. 251-129.150.
Inaba, Hajimu; and Nihei, Ryo, to Fanuc Limited. Industrial robot hand. 4,540,212, Cl. 294-88.000.
Inaba, Hajimu: *See*—
Nakashima, Seiichiro; Inaba, Hajimu; and Inagaki, Shigemi, 4,540,332, Cl. 414-744.00R.
Inaba, Yukio; Igarashi, Taisei; Tahara, Susumu; and Miyatake, Takashi, to Ube Industries, Ltd. Preparation of 2,3-dihydro-2-methyl-2,3-dialkyl-7-oxybenzofurans. 4,540,800, Cl. 549-462.000.
Inagaki, Naoki: *See*—
Takashima, Susumu; Kanke, Takao; Inagaki, Naoki; and Fukushima, Kazumasa, 4,541,111, Cl. 381-51.000.
Inagaki, Shigemi: *See*—
Nakashima, Seiichiro; Inaba, Hajimu; and Inagaki, Shigemi, 4,540,332, Cl. 414-744.00R.
Inagami, Yasuhiro: *See*—
Nagashima, Shigeo; Torii, Shunichi; Omoda, Koichiro; and Inagami, Yasuhiro, 4,541,046, Cl. 364-200.000.
Inco Limited: *See*—
O'Hanlon, Thomas A., 4,540,056, Cl. 175-393.000.
Industries Tanguay Inc.: *See*—
Pelletier, Jean; Filion, Gilles; and Potvin, Clement, 4,540,032, Cl. 144-3.00D.
Ingersoll-Rand Company: *See*—
Zingl, Hans, 4,539,893, Cl. 92-52.000.
Inoue, Makoto; Irie, Hirofumi; Kobayashi, Youichi; and Kubota, Tetuo, to Nittetsu Steel Drum Co., Ltd. Metal containers and their manufacturing method and apparatus. 4,540,323, Cl. 413-6.000.
Institut National de la Sante et de la Reserche Medicale: *See*—
Commeyras, Auguste; Previero, Aldo; and Pugniere, Marine, 4,540,792, Cl. 548-344.000.
Intermedics, Inc.: *See*—
Calfee, Richard V.; Bertasz, Robert N.; Terry, Reese S., Jr.; Gordon, Pat L.; and Baker, Ross G., Jr., 4,539,992, Cl. 128-419.0PG.
International Business Machines Corporation: *See*—
Acitelli, Mario A.; Tynan, Richard F.; and Wayson, Alan R., 4,540,595, Cl. 427-7.000.
Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; Gasdik, Charles E.; Light, David N.; and Pickar, Paul B., 4,540,473, Cl. 204-52.00R.
Danielsen, Kenneth D.; and Winarski, Daniel J., 4,541,027, Cl. 360-137.000.
Dill, Frederick H.; Ling, Daniel T.; and Matick, Richard E., 4,541,075, Cl. 365-189.000.
Mueller, Harald; and Schwerdt, Friedrich, 4,540,464, Cl. 156-639.000.
Sincerbox, Glenn T., 4,540,244, Cl. 350-354.000.
Thorne, William D., 4,540,296, Cl. 400-121.000.
Yau, David W. T.; and Modavis, Robert A., 4,540,251, Cl. 350-611.000.
International Flavors & Fragrances Inc.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,540,812, Cl. 560-256.000.
International Food Equipment, Inc.: *See*—
Reed, Claude A., 4,539,900, Cl. 99-353.000.
International Hydraulic Systems, Inc.: *See*—
Perkins, Gerard T., 4,540,343, Cl. 417-218.000.
International Minerals & Chemical Corp.: *See*—
Hunt, Richard B.; Dancy, William B.; and Alexander, James B., 4,540,577, Cl. 424-153.000.
International Paper Company: *See*—
Fries, Carl J., Jr., 4,540,391, Cl. 493-287.000.
Junod, John E.; and Fairand, Barry P., 4,540,392, Cl. 493-303.000.
International Pipe Machinery Corp.: *See*—
Crawford, Gerald R.; and Kozlowski, Brian J., 4,540,539, Cl. 264-269.000.
International Rectifier Corporation: *See*—
Pelly, Brian R., 4,540,899, Cl. 307-270.000.
International Standard Electric Corporation: *See*—
Szabo, Laszlo, 4,541,120, Cl. 455-86.000.
International Teldata II Corp.: *See*—
Oliver, Stewart W., 4,540,849, Cl. 179-2.0AM.
International Telephone and Telegraph Corporation: *See*—
Neyens, Edward J.; and Vaal, John G., 4,540,958, Cl. 332-16.00R.
Iowa State University Research Foundation, Inc.: *See*—
Lutenegger, Alan J., 4,539,851, Cl. 73-845.000.
Iqbal, Abul: *See*—
Cassar, Luigi; Iqbal, Abul; and Rochat, Alain C., 4,540,791, Cl. 546-335.000.
Irie, Hirofumi: *See*—
Inoue, Makoto; Irie, Hirofumi; Kobayashi, Youichi; and Kubota, Tetuo, 4,540,323, Cl. 413-6.000.
Irie, Namio: *See*—
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, 4,540,059, Cl. 180-141.000.
Irie, Yoichiro; Shigemura, Yutaka; and Namba, Satoshi, to Mita Kogyo Kabushiki Kaisha. Automatic exposure device. 4,540,279, Cl. 355-69.000.
Isaflex AG: *See*—
Helbling, Gottfried, 4,540,427, Cl. 71-27.000.
Ishiai, Hideyuki: *See*—
Hoshika, Shuji; Ishiai, Hideyuki; Nishikawa, Yukiyasu; Hara, Masato; Aiura, Hirochika; Okamoto, Ikuzo; and Shindow, Osamu, 4,540,253, Cl. 351-211.000.
Ishibashi, Tadashi: *See*—
Shibuya, Yoshimichi; Takahashi, Masami; and Ishibashi, Tadashi, 4,540,242, Cl. 350-335.000.
Ishihara, Hideo: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,540,942, Cl. 324-326.000.
Ishii, Ryutaro; and Ogawa, Yuichiro, to Bridgestone Tire Company Limited. Rolled sheet paying out transfer apparatus. 4,540,131, Cl. 242-55.000.
Ishii, Satoshi: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,540,951, Cl. 330-267.000.
Ishii, Shigeru: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; Hatanaka, Masataka; Hirose, Masayoshi; and Kudo, Masaki, 4,540,706, Cl. 514-403.000.
Ishii, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Cathode-ray tube for color display with separate fluorescent layer. 4,540,913, Cl. 313-466.000.
Ishikawa, Fumio, to Sony Corporation. Sample and hold circuit. 4,540,902, Cl. 307-352.000.
Ishikawa, Katsutoshi; Shimotori, Hitoshi; Iida, Noboru; Akihiro, Kazuo; and Ozawa, Shuji, to Mitsui Toatsu Chemicals, Incorporated. 5-Methylthiopyrimidine derivatives, their preparation process and fungicides containing same as active ingredients. 4,540,698, Cl. 514-270.000.
Ishikawa, Kikuo: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,540,951, Cl. 330-267.000.
Ishikawa, Nobuo; and Takaoka, Akio, to Daikin Kogyo Co., Ltd. Methods for preparing lower alkyl α-fluoro-α-cyanoacetate and its carbanion. 4,540,524, Cl. 260-465.400.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Iwanami, Toshio, 4,539,834, Cl. 72-243.000.
Kato, Heiji; Kizaki, Kanji; and Baba, Seizo, 4,539,833, Cl. 72-243.000.
Ishimi, Bunichi. Stepless transmission gear system for automobiles. 4,539,867, Cl. 74-793.000.
Ishiwata, Ichiro: *See*—
Suzuki, Shoji; and Ishiwata, Ichiro, 4,540,072, Cl. 192-4.00A.
Ishizawa, Akio; Hukaya, Toshio; Kumagai, Katuya; and Takeuchi, Tatuo, to Kabushiki Kaisha Toshiba. Magnetic recording medium. 4,540,627, Cl. 428-328.000.
Ishizumi, Kikuo; Ohashi, Naohito; and Muramatsu, Michihisa, to Sumitomo Chemical Co., Ltd. Aminonaphthacene derivatives and their use. 4,540,695, Cl. 514-239.000.
Iskra, Michael J.: *See*—
Pieniak, Heinz A.; and Iskra, Michael J., 4,540,454, Cl. 156-62.200.
Isomet Corporation: *See*—
Bademian, Leon, 4,540,245, Cl. 350-358.000.
Isono, Tetsusaburo: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Shinoda, Noboru; Isono, Tetsusaburo; and Fujiwara, Kenji, 4,540,674, Cl. 501-97.000.
Ito, Haruo: *See*—
Kawaguchi, Seiji; Fujiwara, Takeki; Kodama, Shigeo; Ito, Haruo; and Yamamoto, Kyuemon, 4,540,065, Cl. 182-63.000.
Ito, Higashi: *See*—
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Ito, Takeyasu; and Kuwajima, Teruaki. Anticorrosive metal surface pretreating composition. 4,540,733, Cl. 524-407.000.
Ito, Toshimitsu; and Kobayashi, Nobuyuki, to Toyota Jidosha Kabushiki Kaisha. Method of learn-controlling air-fuel ratio for internal combustion engine. 4,539,958, Cl. 123-440.000.
Itoh, Kazuhiro: *See*—
Tanaka, Hiroshi; Sugisaki, Mutuo; and Itoh, Kazuhiro, 4,539,895, Cl. 92-249.000.
Itoh, Masataka; and Katoh, Shohichi, to Sharp Kabushiki Kaisha. Two-dimensional image readout device. 4,541,015, Cl. 358-212.000.
Iversen, Ralph; and Harris, Dewey F., to Whittaker Corporation. Weatherproof hermetically sealed connector device. 4,540,230, Cl. 339-89.00M.
Iwahashi, Haruo, to Konishiroku Photo Industry Co., Ltd. Controlling method for transferring and separation in a copying apparatus. 4,540,275, Cl. 355-14.0TR.
Iwama, Akira: *See*—
Sakakihara, Masahiko; Hasegawa, Kenzi; and Iwama, Akira, 4,540,638, Cl. 428-693.000.
Iwamoto, Yoshinao: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,540,942, Cl. 324-326.000.
Iwanami, Toshio, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Rolling mill. 4,539,834, Cl. 72-243.000.
Iwasaki, Takao; Ito, Higashi; and Watanabe, Seiichi, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for producing chloroprene. 4,540,838, Cl. 570-229.000.

Iwata, Hitoshi: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,539,903, Cl. 99-470.000.
Iwata, Toshiharu: *See*—
Haraguchi, Hiroshi; Narita, Ko; and Iwata, Toshiharu, 4,539,957, Cl. 123-425.000.
J&J Dental Products Inc.: *See*—
Ying, Lincoln, 4,540,723, Cl. 523-115.000.
J. T. Baker Chemical Company: *See*—
Ramsden, Hugh E., 4,540,486, Cl. 210-198.200.
Jackson, Robert C.; and Luchsinger, Patrick M., to Deere & Company. Method for molding elongated workpieces. 4,540,540, Cl. 264-272.110.
Jacob, Ezekiel J. Xerographic toner composition for producing raised images. 4,540,644, Cl. 430-110.000.
Jacobs, Merrit N., to Eastman Kodak Company. Apparatus for transferring liquid out of a capped container, and analyzer utilizing same. 4,539,855, Cl. 73-864.250.
Jacobson, James W.; Glick, J. Leslie; and Madello, Kenneth L., to Genex Corporation. Composition for cleaning drains clogged with deposits containing hair. 4,540,506, Cl. 252-174.120.
Jacovitz, Bernard. Tool driver and fastener apparatus. 4,539,874, Cl. 81-454.000.
Jaeger, Vincent: *See*—
Nath, Gunther; Kreitmair, Albert; and Jaeger, Vincent, 4,539,987, Cl. 128-303.100.
Jaffe, Walter. Device for the marking of electrical wires and cables, pipes. 4,539,767, Cl. 40-316.000.
Jahrig, Siegfried; and Opitz, Wolfgang, to Siemens Aktiengesellschaft. Vacuum switch with an insulating strut. 4,540,862, Cl. 200-144.00B.
Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM AB. Method of producing a biaxially oriented container of polyethylene terephthalate or similar material. 4,540,544, Cl. 264-532.000.
Jalovec, Lee J., to Tektronix, Inc. Delay compensation method and apparatus for digital display systems. 4,540,982, Cl. 340-743.000.
Jann, James M. Chair height adjustment mechanism. 4,540,148, Cl. 248-406.200.
Japan Exlan Company Limited: *See*—
Kobashi, Toshiyuki; and Takagi, Shoyo, 4,540,754, Cl. 526-88.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Oshima, Noboru; Shimizu, Isamu; and Yoshimura, Yoshito, 4,540,744, Cl. 525-332.900.
Jarmas, Alvydas A.: *See*—
Conrad, Preston C.; and Jarmas, Alvydas A., 4,540,779, Cl. 544-24.000.
Jarret, Jacques: *See*—
Jarret, Jean; and Jarret, Jacques, 4,541,051, Cl. 364-424.000.
Jarret, Jean; and Jarret, Jacques. Electronically controlled land vehicle. 4,541,051, Cl. 364-424.000.
Jarvi, Reino E.; and Tremblay, Phillip G. L. Ice cutter and corer. 4,539,750, Cl. 30-300.000.
Jarvinen, Erkki J.; Taskinen, Pekka M.; Pullo, Jarmo J.; Kinnunen, Seppo T.; and Andersson, Arvo E., to Outokumpu Oy. Immersible aerator and/or mixer apparatus. 4,540,290, Cl. 366-286.000.
Jean Walterscheid GmbH: *See*—
Geisthoff, Hubert; Vollmer, Jurgen; and Herchenbach, Paul, 4,540,305, Cl. 403-13.000.
Kampf, Klaus, 4,540,386, Cl. 464-130.000.
Jedco, Inc.: *See*—
Bostian, Bruce R., 4,539,726, Cl. 16-72.000.
Jensen, Kaj J., to Dansk Industri Syndikat A/S, Conveyor for the stepwise advance of a vertically parted boxless mould through a pouring and cooling zone. 4,540,036, Cl. 164-323.000.
Jentzsch, Arndt: *See*—
Johne, Hans; Jentzsch, Arndt; Doliner, Herbert; Frenzel, Werner; Forster, Karl-Heinz; and Naumann, Johannes, 4,539,907, Cl. 101-248.000.
Jerabek, Robert D.; Koren, Jeffrey G.; and Johnson, Mark W., to PPG Industries, Inc. Pigment grinding vehicle. 4,540,725, Cl. 523-400.000.
Jeviti Pty. Limited: *See*—
Marchant, John, 4,539,913, Cl. 108-7.000.
JGC Corporation: *See*—
Shibata, Setsuo; Koshiba, Yukihiko; Hamamoto, Yoshito; Kugai, Katsutoshi; Kawashima, Akiro; and Fujisawa, Hiroshi, 4,540,490, Cl. 210-323.200.
Jin, Sungho: *See*—
Boredelon, Chester M.; Chin, Gilbert Y.; Jin, Sungho; Sherwood, Richard C.; and Wernick, Jack H., 4,540,453, Cl. 148-31.550.
John Fluke Mfg. Co., Inc.: *See*—
Faulkner, Neil P.; and Prue, Walter W., Jr., 4,541,065, Cl. 364-571.000.
Johne, Hans; Jentzsch, Arndt; Doliner, Herbert; Frenzel, Werner; Forster, Karl-Heinz; and Naumann, Johannes. Method and device for positioning printing cylinder and ink-applying rollers in a printing machine. 4,539,907, Cl. 101-248.000.
Johnsen & Jorgensen Jaypak Limited: *See*—
Maloney, John, 4,540,089, Cl. 206-219.000.
Johnsey, Walter F.: *See*—
Drummond, Donald D.; Johnsey, Walter F.; and Wood, Roy W., 4,540,055, Cl. 175-323.000.
Johnson, Bruce G.: *See*—
Johnson, Louis W.; and Johnson, Bruce G., 4,540,178, Cl. 273-169.000.
Johnson, David E.; and McCall, Kenneth E., to Arcair Company. Swivel cable coupling for an air carbon-arc cutting and gouging torch. 4,540,225, Cl. 339-16.0RC.
Johnson, Eric A.; Demain, Arnold L.; and Madia, Ashwin, to United States of America, Energy. Method of saccharifying cellulose. 4,540,664, Cl. 435-99.000.
Johnson, John H., to Hercules Incorporated. Process for making low crystallinity polyolefins. 4,540,756, Cl. 526-124.000.
Johnson, John K.; Earhart, Jack R.; Astrom, Gordon L.; and Herbig, Mark A., to Aqua-Aerobic Systems, Inc. Filter apparatus. 4,540,487, Cl. 210-264.000.
Johnson & Johnson Dental Products Company: *See*—
Zahradnik, Robert T., 4,540,576, Cl. 424-151.000.
Johnson & Johnson Products, Inc.: *See*—
Barson, Craig, and Denny, Thomas, 4,540,398, Cl. 604-1.000.
Tunc, Deger C., 4,539,981, Cl. 128-92.00B.
Johnson, Louis W.; and Johnson, Bruce G. Golf iron and method of construction. 4,540,178, Cl. 273-169.000.
Johnson, Mark W.: *See*—
Jerabek, Robert D.; Koren, Jeffrey G.; and Johnson, Mark W., 4,540,725, Cl. 523-400.000.
Johnson, Reynold B. Hand-held transducing device for insertable records. 4,541,028, Cl. 360-137.000.
Johnson, Robert N.; and Karol, Frederick J., to Union Carbide Corporation. Polymerization of ethylene with supported π allyl chromium complexes. 4,540,758, Cl. 526-130.000.
Johnson, Timothy W.; and Stone, Mark L., to Phillips Petroleum Company. Conductive patterns in polymeric films. 4,540,620, Cl. 428-195.000.
Johnson, William B. Fluidized bed combustion apparatus and method. 4,539,939, Cl. 122-4.00D.
Johnson, William R.; and Pfister, Larry E., to United States Steel Corporation. Method for the electrodeposition of an iron-zinc alloy coating and bath therefor. 4,540,472, Cl. 204-28.000.
Johnston, Robert J.; Layciak, Stephen G.; and Colista, Dominic, to Westinghouse Electric Corp. Pushbutton interlock. 4,539,860, Cl. 74-483.0PB.
Jonckers, Kees: *See*—
van Nassau, Petrus J. M.; Biermans, Andreas J.; Jonckers, Kees; and de Cooker, Mario G. R. T., 4,540,813, Cl. 564-71.000.
Jones, Donald H., to Contraves Goerz Corporation. Control system for electric motor. 4,540,925, Cl. 318-602.000.
Jones Futura Foundation, Ltd.: *See*—
Fishman, Max; and Nichols, James D., 4,541,008, Cl. 358-13.000.
Jones, Howard P.: *See*—
Lapetina, Robert A.; and Jones, Howard P., 4,540,981, Cl. 340-618.000.
Jones, Lawrence S.: *See*—
Battle, Billy J.; Graham, Robert M.; Jones, Lawrence S.; Malizio, Andrew B.; and Rhodes, George F., 4,540,204, Cl. 285-231.000.
Jordan, Larry B., to Retsco, Inc. Hydropneumatic cable tensioner. 4,540,159, Cl. 254-228.000.
Jorgensen, Ib Greve H.: *See*—
Pedersen, Karsten; Rostrup-Nielsen, Jens R.; Jorgensen, Ib Greve H.; and Andersen, Kjeld J., 4,540,714, Cl. 518-714.000.
Joyce, Robert L.: *See*—
Sashital, Sanat K.; Joyce, Robert L.; and Gentile, Anthony L., 4,540,461, Cl. 156-624.000.
Ju, Shiaw: *See*—
Cozewith, Charles; Ju, Shiaw; and VerStrate, Gary W., 4,540,753, Cl. 526-88.000.
Juergens, Dieter: *See*—
Wadsworth, Charles; and Juergens, Dieter, 4,540,097, Cl. 212-196.000.
Jungbluth, Werner W.: *See*—
Gauert, Rolf; and Jungbluth, Werner W., 4,540,284, Cl. 356-350.000.
Jungen, Hans-Ulrich, to Honeywell Lucifer SA. Pneumatic valve. 4,540,158, Cl. 251-367.000.
Junger, Martin; and Floegel, Karl, to Lechler GmbH & Co. KG. Ultrasonic liquid atomizer. 4,540,123, Cl. 239-102.000.
Junod, John E.; and Fairand, Barry P., to International Paper Company. Method and apparatus to seal coated paperboard materials. 4,540,392, Cl. 493-303.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Moteki, Murato; Shimada, Yoshio; Tanaka, Fumihiro; Watanabe, Fumio; and Komatsu, Kazuyuki, 4,540,992, Cl. 346-76.0PH.
Suzuki, Hayao, 4,540,924, Cl. 318-568.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Ezawa, Sadaaki, 4,539,885, Cl. 84-1.250.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Kada, Hironosuke; Sekino, Teruyoshi; Murayama, Hirogazu; Tatsumi, Iazuaki; and Murakami, Tsudoi, 4,541,062, Cl. 364-513.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Mizumoto, Masakatsu, 4,540,087, Cl. 198-621.000.
Toshihiko, Fukuhara, 4,541,059, Cl. 364-508.000.
Kabushiki Kaisha Nippon Coinco: *See*—
Mori, Yoshikazu; and Kobayashi, Osamu, 4,540,081, Cl. 194-4.00C.
Kabushiki Kaisha Saginomiya Seisakusho: *See*—
Odashima, Takeshi; and Saito, Tsutomu, 4,540,860, Cl. 200-83.00C.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Hattori, Masaichi; Hara, Shigeo; and Manabe, Shunichi, 4,540,965, Cl. 335-259.000.
Kabushiki Kaisha Toshiba: *See*—
Ishizawa, Akio; Hukaya, Toshio; Kumagai, Katuya; and Takeuchi, Tatuo, 4,540,627, Cl. 428-328.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, 4,539,808, Cl. 57-411.000.

Kada, Hironosuke; Sekino, Teruyoshi; Murayama, Hirogazu; Tatsumi, Iazuaki; and Murakami, Tsudoi, to Kabushiki Kaisha Kobe Seiko Sho. Method of interlockingly controlling a robot and positioner. 4,541,062, Cl. 364-513.000.

Kade, Alexander; and Karadsheh, Sam M., to General Motors Corporation. Adaptive servomotor controller. 4,540,923, Cl. 318-561.000.

Kadi, Frank G., to Micronix Partners. Optical objective adjusting apparatus. 4,540,240, Cl. 350-255.000.

Kagei, Kengo: *See*—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,540,704, Cl. 514-389.000.

Kaida, Shinichi; and Uchiyama, Kaoru, to Fuji Photo Film Co., Ltd. Film handling method. 4,540,456, Cl. 156-159.000.

Kajiyama, Takashi: *See*—
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; Kajiyama, Takashi; and Hotta, Kunihiko, 4,540,449, Cl. 148-31.500.

Kako, Hiroyoshi; Kobayashi, Nobuo; Tanimoto, Iwao; and Aiba, Shigeo, to Toyota Jidosha Kabushiki Kaisha. Rack-and-pinion type steering gear. 4,539,857, Cl. 74-422.000.

Kakuhashi, Takeshi; Tahara, Hiroshi; and Mori, Yoshihisa, to Nitto Electric Industrial Co., Ltd. Resistor sheet input tablet and method for the production of parts for same. 4,540,463, Cl. 156-630.000.

Kalidas, Navinchandra: *See*—
Thompson, Raymond W.; Kalidas, Navinchandra; Abbott, John H.; and Laffitte, David S., 4,540,226, Cl. 339-17.0CF.

Kalkbrenner, Ralph W.: *See*—
Antol, Ronald F.; Kalkbrenner, Ralph W.; and Kobuck, Richard M., 4,539,738, Cl. 29-467.000.

Kalverkamp, Klemens. Method and apparatus for harvesting corn or other cereals. 4,539,799, Cl. 56-60.000.

Kambara, Jun; Ohmuro, Yuzo; and Kamogawa, Nin-ichi, to Konishiroku Photo Industry Co., Ltd. Method of developing an electrostatic latent image. 4,540,646, Cl. 430-122.000.

Kamezaki, Yasushi: *See*—
Honda, Nobuyasu; Matsui, Toshikazu; Fushida, Akira; Ikeda, Toshimitsu; Takahashi, Kenji; Fukuda, Hideo; Kamezaki, Yasushi; and Tshenka, Takashi, 4,540,645, Cl. 430-122.000.

Kamo, Takashi: *See*—
Sakurai, Shigenori; Kamo, Takashi; and Furutani, Toshinobu, 4,540,479, Cl. 204-427.000.

Kamogawa, Nin-ichi: *See*—
Kambara, Jun; Ohmuro, Yuzo; and Kamogawa, Nin-ichi, 4,540,646, Cl. 430-122.000.

Kamohara, Eiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for making CRT shadow masks. 4,540,374, Cl. 445-37.000.

Kamornicki, Jacques: *See*—
Gautier, Jean C.; and Kamornicki, Jacques, 4,540,448, Cl. 148-6.15R.

Kamp, Ewald A., to Union Carbide Corporation. Method and extruding die apparatus for producing a plastic closure strip. 4,540,537, Cl. 264-171.000.

Kampf, Klaus, to Jean Walterscheid GmbH. Axial securing device for universal joint assembly. 4,540,386, Cl. 464-130.000.

Kan, Jean-Paul: *See*—
Biziere, Kathleen; Hallot, Andre ; and Kan, Jean-Paul, 4,540,696, Cl. 514-254.000.

Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; Furukawa, Osamu; Endo, Hiroshi; Hirao, Osamu; and Hayashi, Masaru, to Tokyo Shibaura Denki Kabushiki Kaisha. Metal oxide varistor made by a co-precipation process and freeze-dried. 4,540,971, Cl. 338-21.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Junzo; Ogura, Masahiro; Kanema, Hiroshi; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,540,665, Cl. 435-146.000.
Miyamoto, Kaoru, 4,540,513, Cl. 260-112.50R.
Senda, Kenichi; Ando, Masao; Nakamura, Kyoichi; and Nishida, Tatehiko, 4,540,718, Cl. 521-58.000.
Tomita, Haruo; and Yonezawa, Kazuya, 4,540,802, Cl. 549-557.000.
Viscontini, Max, 4,540,783, Cl. 544-258.000.

Kaneko, Masashi: *See*—
Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, 4,539,808, Cl. 57-411.000.

Kanema, Hiroshi: *See*—
Hasegawa, Junzo; Ogura, Masahiro; Kanema, Hiroshi; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,540,665, Cl. 435-146.000.

Kanke, Takao: *See*—
Takashima, Susumu; Kanke, Takao; Inagaki, Naoki; and Fukushima, Kazumasa, 4,541,111, Cl. 381-51.000.

Kanno, Akihiko: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,540,689, Cl. 514-196.000.

Kanou, Ikuo; Yanagiuchi, Shigenobu; and Omori, Takuro, to Sharp Kabushiki Kaisha. Storing address codes with words for alphabetical accessing in an electronic translator. 4,541,069, Cl. 364-900.000.

Kansai Paint Co., Ltd.: *See*—
Kikuta, Makoto; and Terasawa, Hideo, 4,539,931, Cl. 118-404.000.

Kanzaki, Koichi; and Taguchi, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device and method for manufacturing the same. 4,539,742, Cl. 29-576.00W.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Arai, Naoto, 4,540,999, Cl. 346-216.000.

Kapadya, Aftab H.: *See*—
Gunderson, Charles; and Kapadya, Aftab H., 4,540,993, Cl. 346-139.00R.

Karadsheh, Sam M.: *See*—
Kade, Alexander; and Karadsheh, Sam M., 4,540,923, Cl. 318-561.000.

Karalis, Anastasios: *See*—
Longley, Kermit D.; and Karalis, Anastasios, 4,540,807, Cl. 560-151.000.

Kariya, Izumi; and Eguchi, Yzsuhito, to Sony Corporation. Thermal printing system. 4,540,991, Cl. 346-76.0PH.

Karl, Curtis L., to Henkel Corporation. Synergistic thickener mixtures of amps polymers with other thickeners. 4,540,510, Cl. 252-315.300.

Karl Fischer Industrienlagen GmbH: *See*—
Gerking, Luder; and Panke, Gunter, 4,540,774, Cl. 528-502.000.

Karl, Otto, to Veitscher Magnesitwerke-actien-Gesellschaft. Prismatic refractory brick for glass melting furnace chambers. 4,540,039, Cl. 165-9.400.

Karls, Michael A., to Brunswick Corporation. Flushing device for outboard motors. 4,540,009, Cl. 134-167.00R.

Karol, Frederick J.: *See*—
Johnson, Robert N.; and Karol, Frederick J., 4,540,758, Cl. 526-130.000.

Kasai, Kazumi, to Nippon Notion Kogyo Co., Ltd. Snap-fit button assembly. 4,539,735, Cl. 24-621.000.

Kasai, Minoru: *See*—
Nakamura, Minoru; and Kasai, Minoru, 4,539,796, Cl. 53-576.000.

Kasai, Yoshiharu: *See*—
Ueda, Ikuo; Kato, Masayuki; and Kasai, Yoshiharu, 4,540,692, Cl. 514-225.000.

Kasamatsu, Mikizo. Circuit breaking element. 4,540,970, Cl. 337-297.000.

Kashiwagi, Takao: *See*—
Kobayashi, Hideo; Kashiwagi, Takao; Yoshimura, Kunimasa; and Mae, Hisao, 4,539,942, Cl. 123-41.100.

Kashiwai, Mikio, to Honda Giken Kogyo Kabushiki Kaisha. Rear wheel supporting system for motorcycle. 4,540,062, Cl. 180-227.000.

Kasugai, Joji; and Nakagami, Akihiro, to Toyoda Gosei Co., Ltd. Cap with a valve unit. 4,540,103, Cl. 220-203.000.

Kato, Heiji; Kizaki, Kanji; and Baba, Seizo, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Rolling mill with flatness control facility. 4,539,833, Cl. 72-243.000.

Kato, Kazuaki; and Washizu, Tomio, to NGK Insulators, Ltd.; and Takamatsu Electric Works, Ltd. Open fuse cutout. 4,540,968, Cl. 337-31.000.

Kato, Masayuki: *See*—
Ueda, Ikuo; Kato, Masayuki; and Kasai, Yoshiharu, 4,540,692, Cl. 514-225.000.

Kato, Shinichi: *See*—
Maruyama, Masanori; Fukushima, Masakazu; Kato, Shinichi; and Ogusu, Chihaya, 4,540,916, Cl. 315-16.000.

Katoh, Shohichi: *See*—
Itoh, Masataka; and Katoh, Shohichi, 4,541,015, Cl. 358-212.000.

Katsuyama, Akira, to Sony Corporation. Devices for displaying addresses on a record medium. 4,541,022, Cl. 360-72.200.

Kaufman, Nancy K.: *See*—
Harte, Richard A.; Chen, Anthony B.; and Kaufman, Nancy K., 4,540,660, Cl. 435-7.000.

Kaufmann, Vendelin: *See*—
Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Renker, Wolfgang; and Kober, Roland, 4,540,494, Cl. 210-750.000.

Kaufmann, William A., to Teledyne Industries, Inc. Machine for electric arc welding and air carbon arc gouging on vertical curved or straight walls. 4,540,870, Cl. 219-126.000.

Kaukaskie, Donald C., to Deere & Company. Dual brake pedal lock mechanism. 4,539,863, Cl. 74-540.000.

Kaul, Bansi L., to Sandoz Ltd. 1,4-Di-[2'-(2",4"-dichlorophenylazo)acetoacetamido]-2,5-dimethylbenzene. 4,540,775, Cl. 534-575.000.

Kaun, Thomas D., to United States of America, Energy. Cell design for lithium alloy/metal sulfide battery. 4,540,642, Cl. 429-131.000.

Kawabata, Yasuhiro: *See*—
Tsuchikawa, Shunzo; and Kawabata, Yasuhiro, 4,539,943, Cl. 123-41.050.

Kawagishi, Toshio: *See*—
Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, 4,540,654, Cl. 430-381.000.

Kawaguchi, Seiji; Fujiwara, Takeki; Kodama, Shigeo; Ito, Haruo; and Yamamoto, Kyuemon, to Dowa Mining Co., Ltd. Apparatus for wall timbering of drifts, tunnels, and the like. 4,540,065, Cl. 182-63.000.

Kawaharada, Hajime: *See*—
Hasegawa, Junzo; Ogura, Masahiro; Kanema, Hiroshi; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,540,665, Cl. 435-146.000.

Kawai, Hisasi: *See*—
Morino, Seiji; and Kawai, Hisasi, 4,540,905, Cl. 310-12.000.

Kawai, Koichi; and Mikuriya, Minoru, to Nippon Kokan Kabushiki Kaisha. Device for sealing the floating roof of an oil tank. 4,540,104, Cl. 220-224.000.

Kawai, Toshikazu; Negishi, Akira; Ojima, Iwao; and Fuchikami, Takamasa, to Central Glass Company Limited; and Chemical Research Center. Preparation of 2-trifluoromethylpropanol by vapor phase hydrogenation of 2-trifluoromethylpropanal. 4,540,835, Cl. 568-842.000.

Kawakubo, Yukio: *See*—
Kuwabara, Kouji; Sasaki, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,541,097, Cl. 372-87.000.

Kawamura, Kazunori; Yamashita, Shinichi; Yokoyama, Yuichi; and Tsuchiya, Makoto, to Hoya Lens Corporation. Oxygen-permeable hard contact lens. 4,540,761, Cl. 526-245.000.

Kawanami, Isao, to Asahi Yukizai Kogyo Co., Ltd. Ball valve. 4,540,157, Cl. 251-315.000.

Kawanishi, Toshio; and Hareyama, Satoshi, to Teikoku Sen-I Co., Ltd. Fabric articles having a flame-resistant coating on at least one surface thereof. 4,540,617, Cl. 428-137.000.

Kawasaki, Takao; Tsuchiya, Tadashi; and Osaka, Yoshiaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. 2-Substituted-4-thiazolidones. 4,540,702, Cl. 514-369.000.

Kawase, Mayumi: *See*—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,540,704, Cl. 514-389.000.

Kawase, Shigeki: *See*—
Suzuki, Takashi; Hibino, Kunio; Murai, Mikio; Kawase, Shigeki; and Shinohara, Koichi, 4,540,618, Cl. 428-141.000.

Kawashima, Akiro: *See*—
Shibata, Setsuo; Koshiba, Yukihiko; Hamamoto, Yoshito; Kugai, Katsutoshi; Kawashima, Akiro; and Fujisawa, Hiroshi, 4,540,490, Cl. 210-323.200.

Kawashima, Saburo: *See*—
Yamaguchi, Keizaburo; Sugimoto, Kenichi; Tanabe, Yoshimitsu; Kawashima, Saburo; and Yamaguchi, Akihiro, 4,540,818, Cl. 564-330.000.

Kawasumi, Kouzi: *See*—
Hayashi, Mikio; Kawasumi, Kouzi; and Kimura, Yoshinobu, 4,540,252, Cl. 350-634.000.

Kawata, Shoji; Hyodo, Hitoshi; and Akita, Tokihiko, to Aisin Seiki Kabushiki Kaisha. Automobile speed control system. 4,540,060, Cl. 180-179.000.

Kayane, Yutaka: *See*—
Otake, Katsumasa; Omura, Takashi; Kayane, Yutaka; and Imada, Kunihiko, 4,540,418, Cl. 8-524.000.

Kazi, Shaukat: *See*—
Kolchinsky, Abel E.; and Kazi, Shaukat, 4,540,154, Cl. 251-129.150.

Kedl, Robert J.: *See*—
Ternes, Mark P.; and Kedl, Robert J., 4,540,501, Cl. 252-70.000.

Keener, Robert M.; and Chakrawarti, Shekhar, to R. W. Beckett Corporation. High current float switch. 4,540,891, Cl. 307-118.000.

Keirsey, James L.: *See*—
Dale, Lawrence A.; Grenleski, Stephen E., Jr.; Keirsey, James L.; and Stevens, Charles E., 4,539,811, Cl. 60-270.100.

Kelley, Paul E.: *See*—
Stafford, George C.; Kelley, Paul E.; and Stephens, David R., 4,540,884, Cl. 250-282.000.

Kellogg, Michael S., to Pfizer Inc. Antibacterial 6'-(2-amino-2-[4-acyloxyphenyl]acetamido)penicillanoyloxymethyl penicillanate 1,1-dioxide compounds. 4,540,687, Cl. 514-193.000.

Kelly, Elisabeth: *See*—
Dar, Jamshed B.; Bruckmann, Robert H.; and Kelly, Elisabeth, 4,540,591, Cl. 426-388.000.

Kelly, Timm L., to Amchem Products, Inc. Aluminum cleaner and system. 4,540,444, Cl. 134-3.000.

Kelsey-Hayes Company: *See*—
Evans, Anthony C., 4,540,066, Cl. 188-71.900.

Kendall Company, The: *See*—
Van Overloop, Ronald R., 4,540,412, Cl. 604-291.000.
Zimmermann, William D., 4,540,738, Cl. 524-707.000.

Kennecott Corporation: *See*—
Schneider, Walter; Ebert, Klaus-Peter; and Otto, Konrad, 4,540,183, Cl. 277-1.000.

Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham, to Nagel, Kennedy, Arad & Associates. Toy vehicle having variable drive. 4,540,380, Cl. 446-463.000.

Kennedy, William J.; and Beucus, A. John, to Beu-Tex Corp. Method for continuously treating staple length textile fibrous materials. 4,539,724, Cl. 8-149.100.

Kent, William C., to AT&T Technologies, Inc. Apparatus for compacting loose wraps of wire on terminals. 4,540,030, Cl. 140-93.00R.

Kern, Hans: *See*—
Wolfsgruber, Friedrich; Weiser, Ernst A.; Gmohling, Werner; Kern, Hans; and Reifferscheid, Karl J., 4,540,436, Cl. 75-130.00A.

Kern, Otmar, to Georg Neumann GmbH. Electroacoustic transducer system. 4,541,112, Cl. 381-113.000.

Kerotest Manufacturing Corp.: *See*—
Owoc, James R.; and Tremblay, Richard P., 4,540,019, Cl. 137-557.000.

Kerpers, Werner; Bonk, Werner; Roser, Dieter; and Fuhrer, Hans-Jurgen, to Licentia Patent-Verwaltungs-GmbH. Method for installing a motor-compressor unit in a cooling device. 4,539,737, Cl. 29-423.000.

Kerr-McGee Chemical Corporation: *See*—
Rado, Theodore A., 4,540,441, Cl. 106-300.000.

Kerrey, John S.: *See*—
Wolfe, Donald L.; Clements, Jack W.; and Kerrey, John S., 4,541,055, Cl. 364-474.000.

Kessler, Stephen B., to Millipore Corporation. Method and apparatus for treating whole blood. 4,540,492, Cl. 210-651.000.

Kester, Gerardus J. A. N., to Fokker B.V. System for breaking a tensioned connecting element. 4,540,873, Cl. 219-200.000.

Keszthelyi, Ewald: *See*—
Drewry, Hugh S.; and Keszthelyi, Ewald, 4,540,888, Cl. 290-1.00R.

Keyworth, Donald A.; and McFarland, Cecil G., to Petro-Tex Chemical Corporation. Process for the production of polymer gasoline. 4,540,839, Cl. 585-520.000.

Khoylian, Rouzas R.: *See*—
Cowdery, James R.; Park, David B.; and Khoylian, Rouzas R., 4,540,083, Cl. 198-465.100.

Kidd Creek Mines Limited: *See*—
O'Hanlon, Thomas A., 4,540,056, Cl. 175-393.000.

Kido, Nobuyuki: *See*—
Takahashi, Kunio; Oda, Noriyuki; Kido, Nobuyuki; and Muramatsu, Keizi, 4,540,184, Cl. 277-12.000.

Kiene, Wilfried: *See*—
Appel, Eggert; Geisler, Gottfried; and Kiene, Wilfried, 4,539,853, Cl. 73-861.120.

Kieser, Manfred, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for incorporating pigments into thermoplastics, and adhesion promoters for use in this process. 4,540,730, Cl. 524-230.000.

Kikuchi, Yoshiki, to Fuji Xerox Co., Ltd. Magnetic bubble display device. 4,541,072, Cl. 365-29.000.

Kikuta, Makoto; and Terasawa, Hideo, to Kansai Paint Co., Ltd. Coating apparatus. 4,539,931, Cl. 118-404.000.

Kimura, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Heat storage material. 4,540,502, Cl. 252-70.000.

Kimura, Katsuji, to Nippon Electric Company Ltd. Receiver including FET frequency mixer. 4,541,122, Cl. 455-236.000.

Kimura, Kenji, to Olympus Optical Co., Ltd. Data recording/reproducing apparatus. 4,541,020, Cl. 360-22.000.

Kimura, Masatoshi: *See*—
Abe, Fumitaka; Kimura, Masatoshi; Watanabe, Toshihiko; and Yamada, Hiroshi, 4,540,272, Cl. 355-4.000.

Kimura, Ryoji: *See*—
Nakahara, Yutaka; and Kimura, Ryoji, 4,540,728, Cl. 524-100.000.

Kimura, Yoshinobu: *See*—
Hayashi, Mikio; Kawasumi, Kouzi; and Kimura, Yoshinobu, 4,540,252, Cl. 350-634.000.

Kinashi, Hiroshi: *See*—
Imanaka, Yoshiaki; and Kinashi, Hiroshi, 4,540,270, Cl. 355-3.00R.

Kinkori, Shuzo: *See*—
Sawada, Toshiichi; Fukami, Yasuhiko; and Kinkori, Shuzo, 4,539,947, Cl. 123-52.00M.

Kinnunen, Seppo T.: *See*—
Jarvinen, Erkki J.; Taskinen, Pekka M.; Pullo, Jarmo J.; Kinnunen, Seppo T.; and Andersson, Arvo E., 4,540,290, Cl. 366-286.000.

Kirchhoff, Robert A., to Dow Chemical Company, The. Polymers derived from poly(arylcyclobutenes). 4,540,763, Cl. 526-281.000.

Kiszel, Janos; Papp, Laszlo ; and Nagy, Laszlo , to Vas es Moszeripari Szovetkezet. Respirator device particularly for use in perinatal medicine. 4,539,984, Cl. 128-204.230.

Kitajima, Masao: *See*—
Arai, Fuminori; and Kitajima, Masao, 4,540,670, Cl. 436-170.000.

Kizaki, Kanji: *See*—
Kato, Heiji; Kizaki, Kanji; and Baba, Seizo, 4,539,833, Cl. 72-243.000.

Klapdor, Ute: *See*—
Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; van der Maas, Hendrikus; and Suerken, Hans-Peter, 4,540,777, Cl. 536-102.000.

Klasen, Daniel A.; and Denucci, John F., to Vollrath Company, The. Refrigerator door pull and latch assembly. 4,540,207, Cl. 292-341.170.

Klatt, John H.; and Scheib, Thomas J., to Babcock & Wilcox Company, The. Sootblowing system with identification of model parameters. 4,539,840, Cl. 73-112.000.

Klein, Edward P.; and Nissan, Alfred H., to Westvaco Corporation. Belt washing improvements. 4,539,827, Cl. 68-3.0SS.

Klinger, Christine L. Infant safety seat attachment. 4,540,219, Cl. 297-487.000.

Klinner, Wilfred E., to National Research Development Corporation. Apparatus and method for conveying and/or treating crop. 4,539,798, Cl. 56-16.400.

Klockenbusch, Heinrich: *See*—
Ahrens, Norbert; Heinemann, Otto; Klockenbusch, Heinrich; and Kluger, Wolfgang, 4,539,782, Cl. 52-192.000.

Klomp, Edward D., to General Motors Corporation. Selective asymmetric swirl intake port. 4,539,954, Cl. 123-188.0VA.

Klug, Rudolf; Hartner, Hartmut; Merrem, Hans-Joachim; and Neisius, Karl H., to Merck Patent Gesellschaft mit beschrankter Haftung. Photoresists suitable for forming relief structures of highly heat-resistant polymers. 4,540,650, Cl. 430-281.000.

Kluger, Wolfgang: *See*—
Ahrens, Norbert; Heinemann, Otto; Klockenbusch, Heinrich; and Kluger, Wolfgang, 4,539,782, Cl. 52-192.000.

Klundt, Kurt, to G.M. Pfaff AG. Needle bar drive for counterbalanced sewing machines. 4,539,922, Cl. 112-221.000.

KMG Systems Limited: *See*—
Maddocks, Keith L., 4,540,082, Cl. 198-358.000.

Knazko, Luba: *See*—
McCaffrey, Eugene F.; Dieterman, Alfred J.; and Knazko, Luba, 4,540,511, Cl. 252-321.000.

Knickerbocker Company, The: *See*—
Taylor, William L., 4,540,330, Cl. 414-641.000.

Knifton, John F., to Texaco Development Corporation. Manufacture of alkanol and glycol esters. 4,540,810, Cl. 560-226.000.

Knoop, Franz-Josef, to Nixdorf Computer AG. Modular switch unit with snap-in base, separate modular switch unit and cover coded switch actuating interior lugs. 4,540,858, Cl. 200-5.00R.

Knoop, Jack P. Variable length tab-forming device for tape roll holders. 4,540,393, Cl. 493-353.000.

Knoth, Norbert; and Miehe, Friedrich V., to Francotyp Gesellschaft mbH. Electronically controlled postage metering machine and free stamping machine. 4,541,053, Cl. 364-466.000.

Knud Simonsen Industries Ltd.: *See*—
Norrie, Lyle W.; and Pawlicki, Richard I., 4,540,094, Cl. 211-113.000.

Kobashi, Toshiyuki; and Takagi, Shoyo, to Japan Exlan Company Limited. Process for producing high molecular weight acrylonitrile polymers. 4,540,754, Cl. 526-88.000.

Kobayashi, Akio: *See*—
Honda, Masakazu; Harada, Susumu; and Kobayashi, Akio, 4,541,050, Cl. 364-424.000.

Kobayashi, Hideo; Kashiwagi, Takao; Yoshimura, Kunimasa; and Mae, Hisao, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine cooling system and method of operation thereof. 4,539,942, Cl. 123-41.100.

Kobayashi, Koji; Noguchi, Kiyoshi; and Takayama, Suguru, to TDK Corporation. Process for producing a magnetic recording medium. 4,540,600, Cl. 427-130.000.

Kobayashi, Nobuo: *See*—
Kako, Hiroyoshi; Kobayashi, Nobuo; Tanimoto, Iwao; and Aiba, Shigeo, 4,539,857, Cl. 74-422.000.

Kobayashi, Nobuyuki: *See*—
Ito, Toshimitsu; and Kobayashi, Nobuyuki, 4,539,958, Cl. 123-440.000.

Kobayashi, Osamu: *See*—
Mori, Yoshikazu; and Kobayashi, Osamu, 4,540,081, Cl. 194-4.00C.

Kobayashi, Shigeru, to Marukokeihouki Co., Ltd. Electric horns. 4,540,975, Cl. 340-388.000.

Kobayashi, Shiro: *See*—
Saegusa, Takeo; Kobayashi, Shiro; and Moriuchi, Yasuhiro, 4,540,747, Cl. 525-410.000.

Kobayashi, Takehiro: *See*—
Uetsuki, Haruo; and Kobayashi, Takehiro, 4,540,135, Cl. 242-84.51R.

Kobayashi, Youichi: *See*—
Inoue, Makoto; Irie, Hirofumi; Kobayashi, Youichi; and Kubota, Tetuo, 4,540,323, Cl. 413-6.000.

Kober, Roland: *See*—
Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Renker, Wolfgang; and Kober, Roland, 4,540,494, Cl. 210-750.000.

Kobori, Takeo: *See*—
Sakai, Kunikazu; Tunemoto, Daiei; Kobori, Takeo; and Kondo, Kiyosi, 4,540,794, Cl. 548-127.000.

Kobuck, Richard M.: *See*—
Antol, Ronald F.; Kalkbrenner, Ralph W.; and Kobuck, Richard M., 4,539,738, Cl. 29-467.000.

Kodaira, Makoto, to Uro Denshi Kogyo Kabushiki Kaisha. Ultrasonic alarm device. 4,541,080, Cl. 367-94.000.

Kodama, Shigeo: *See*—
Kawaguchi, Seiji; Fujiwara, Takeki; Kodama, Shigeo; Ito, Haruo; and Yamamoto, Kyuemon, 4,540,065, Cl. 182-63.000.

Koemm, Ulrich; and Geisler, Klaus, to Bayer Aktiengesellschaft. Polyurethanes containing perfluoroalkyl groups and a process for their production. 4,540,765, Cl. 528-45.000.

Kogane, Mikio; and Yamazaki, Seiichi, to Fuji Photo Film Co., Ltd. Device for detecting whether or not one end of a belt-shaped sheet is locked. 4,540,324, Cl. 414-20.000.

Kogawa, Takashi, to Hitachi, Ltd. Path control method and apparatus. 4,541,060, Cl. 364-513.000.

Kohama, Hajime: *See*—
Mizunoya, Nobuyuki; Kohama, Hajime; and Sugiura, Yasuyuki, 4,540,462, Cl. 156-630.000.

Kohashi, Tadao, to Matsushita Electric Industrial Co., Ltd. Transfer recording method and apparatus therefor. 4,541,042, Cl. 346-76.0PH.

Kohler Company: *See*—
Drewry, Hugh S.; and Keszthelyi, Ewald, 4,540,888, Cl. 290-1.00R.

Kohn, Erhard: *See*—
Colquhoun, Alexander; and Kohn, Erhard, 4,541,000, Cl. 357-15.000.

Koike, Eishi, to Ozen Corporation. Simple acoustic playback device for a record having plurality of recording grooves. 4,541,085, Cl. 369-65.000.

Koivunen, Erkki A., to General Motors Corporation. Continuously variable transmission. 4,539,866, Cl. 74-665.0GE.

Kojima, Keiichi: *See*—
Nagasaki, Shoji; Kojima, Keiichi; and Ueno, Keiji, 4,540,597, Cl. 427-44.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,540,942, Cl. 324-326.000.

Kolc, Jaroslav F.: *See*—
Van Der Puy, Michael; Hendrickson, Larry L.; Kolc, Jaroslav F.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,540,428, Cl. 71-28.000.

Kolchinsky, Abel E.; and Kazi, Shaukat, to Imperial Clevite Inc. Solenoid valve. 4,540,154, Cl. 251-129.150.

Koller, Joseph A., to Balax, Inc. Hole sizing tool. 4,539,832, Cl. 72-118.000.

Kolzer, Walter; and Reischer, Wilhelm, to Siemens Aktiengesellschaft. Circuit arrangement for an alternating control. 4,540,926, Cl. 318-609.000.

Komatsu, Kazuyuki: *See*—
Moteki, Murato; Shimada, Yoshio; Tanaka, Fumihiro; Watanabe, Fumio; and Komatsu, Kazuyuki, 4,540,992, Cl. 346-76.0PH.

Komazawa, Hiroyasu; Hotta, Hiroshi; Nakatsuji, Hiroshi; Yoko, Kiyoshi; Higashiyama, Seiichi; Nakashima, Tuneyasu; and Gotoh, Noboru, to Polyplastics Company, Ltd. Method of producing an improved polyacetal polymer. 4,540,773, Cl. 528-480.000.

Kondo, Hirofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Devices for securing fuel assemblies to nuclear reactor pressure vessels. 4,540,545, Cl. 376-364.000.

Kondo, Kazuo; and Okuyama, Masahiko, to NGK Spark Plug Co., Ltd. Glass-ceramic product. 4,540,671, Cl. 501-9.000.

Kondo, Kiyosi: *See*—
Sakai, Kunikazu; Tunemoto, Daiei; Kobori, Takeo; and Kondo, Kiyosi, 4,540,794, Cl. 548-127.000.

Kondo, Ryoji; Takamura, Kozo; and Higuchi, Kanji, to Nippondenso Co., Ltd. Spark plug for internal-combustion engine. 4,540,910, Cl. 313-11.500.

Kondow, Ryotaro: *See*—
Andow, Fumio; Yamaura, Mitsuru; and Kondow, Ryotaro, 4,541,058, Cl. 364-483.000.

Kong, Yu-Lin: *See*—
Monaghan, Richard L.; and Kong, Yu-Lin, 4,540,575, Cl. 424-115.000.

Konig, Klaus: *See*—
Rasshofer, Werner; Grogler, Gerhard; Konig, Klaus; and Dieterich, Dieter, 4,540,720, Cl. 521-159.000.

Konishi, Hiroyuki; Hino, Naganori; Matsumoto, Hiroshi; and Yoshida, Ryo, to Sumitomo Chemical Company, Limited. Diphenyl sulfide compounds useful as intermediates in the production of diphenyl sulfone compounds. 4,540,824, Cl. 568-45.000.

Konishi, Masahiro; and Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Electronic still camera. 4,541,021, Cl. 360-35.100.

Konishi, Masami: *See*—
Nouno, Yasushi; Konishi, Masami; and Sasaki, Yoshio, 4,539,952, Cl. 123-90.360.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujimaki, Yoshihide; Takei, Yoshiaki; and Nomori, Hiroyuki, 4,540,651, Cl. 430-72.000.
Iwahashi, Haruo, 4,540,275, Cl. 355-14.0TR.
Kambara, Jun; Ohmuro, Yuzo; and Kamogawa, Nin-ichi, 4,540,646, Cl. 430-122.000.
Nishijima, Toyoki; and Onodera, Kaoru, 4,540,653, Cl. 430-372.000.
Nishizima, Toyoki; Sasaki, Masao; and Onodera, Kaoru, 4,540,656, Cl. 430-505.000.
Sasaki, Masao; and Onodera, Kaoru, 4,540,658, Cl. 430-551.000.
Tamura, Takashi, 4,540,273, Cl. 355-8.000.

Konnemann, Alfred; and Ehrenberg, Jorgen, to Grote & Hartmann GmbH & Co. KG. Round plug socket provided with an over-spring. 4,540,234, Cl. 339-259.00R.

Kopacz, Robert F.; and Hamill, Timothy. Educational visual apparatus. 4,540,368, Cl. 434-276.000.

Koren, Jeffrey G.: *See*—
Jerabek, Robert D.; Koren, Jeffrey G.; and Johnson, Mark W., 4,540,725, Cl. 523-400.000.

Korpman, Ralf, to Personal Products Company. Disposable diaper with a repositionable tape tab fastener. 4,540,415, Cl. 604-390.000.

Kortlever, LeRoy A.: *See*—
Maranell, M. C.; and Kortlever, LeRoy A., 4,539,938, Cl. 119-75.000.

Kosaka, Tomoyoshi: *See*—
Torii, Michihiro; Kosaka, Tomoyoshi; Maeda, Takeo; and Rikukawa, Hiroshi, 4,540,500, Cl. 252-62.580.

Koshiba, Yukihiko: *See*—
Shibata, Setsuo; Koshiba, Yukihiko; Hamamoto, Yoshito; Kugai, Katsutoshi; Kawashima, Akiro; and Fujisawa, Hiroshi, 4,540,490, Cl. 210-323.200.

Kosuzume, Hiroshi: *See*—
Ohnishi, Haruo; Kosuzume, Hiroshi; Suzuki, Yasuo; and Mochida, Ei, 4,540,569, Cl. 424-94.000.

Koszi, Louis A.: *See*—
Anthony, Philip J.; Hartman, Robert L.; Koszi, Louis A.; and Schwartz, Bertram, 4,539,743, Cl. 29-576.0B.

Koszyk, Kathleen. Compact portable humidifier. 4,540,529, Cl. 261-91.000.

Kotobuki & Co., Ltd.: *See*—
Midorikawa, Yoshio, 4,540,300, Cl. 401-107.000.

Koza, John R.: *See*—
Oberdeck, Martin K.; and Koza, John R., 4,540,628, Cl. 428-336.000.

Kozlowski, Brian J.: *See*—
Crawford, Gerald R.; and Kozlowski, Brian J., 4,540,539, Cl. 264-269.000.

Kraft, Inc.: *See*—
Myer, William J.; and Lamppa, Reid G., 4,540,592, Cl. 426-557.000.

Kramer, Erich: *See*—
Henk, Hermann; Kramer, Erich; Schundehutte, Karl H.; and Nickel, Horst, 4,540,776, Cl. 534-635.000.

Kramer, G. Richard, to Polaroid Corporation. Film processor having a loading door interlock. 4,540,263, Cl. 354-304.000.

Krasser, Fritz; and Peter, Josef, to Ellenberger & Poensgen GmbH. Actuating fixture for push-pull switch. 4,540,864, Cl. 200-302.200.

Kreibiehl, Guenter: *See*—
Mahnke, Harald; Woerner, Frank P.; Weber, Heinz; and Kreibiehl, Guenter, 4,540,717, Cl. 521-52.000.
Kreitmair, Albert: *See*—
Nath, Gunther; Kreitmair, Albert; and Jaeger, Vincent, 4,539,987, Cl. 128-303.100.
Kremer, Andre ; and Wolwert, Marcel, to Paul Wurth S.A. Apparatus for weighing heavy loads. 4,540,058, Cl. 177-255.000.
Krems-Chemie, Gesellschaft mbH: *See*—
Ronge, Helmut; Prantz, Erhard; and Schoerkhuber, Wolfgang, 4,540,635, Cl. 428-498.000.
Krishnamurthy, Sundaram, to Eastman Kodak Company. Photographic coupler solvents and photographic elements employing same. 4,540,657, Cl. 430-546.000.
Kromer, Philip F., III, to Racal-Milgo, Inc. Microprocessor architecture employing efficient operand and instruction addressing. 4,541,045, Cl. 364-200.000.
Krude, Werner, to Uni-Cardan Aktiengesellschaft. Drive shaft assembly. 4,540,385, Cl. 464-113.000.
Krupp Polysius AG: *See*—
Ahrens, Norbert; Heinemann, Otto; Klockenbusch, Heinrich; and Kluger, Wolfgang, 4,539,782, Cl. 52-192.000.
Kubo, Yoshiharu, to AWA Engineering Co., Ltd. Apparatus for winding video tape on reels of a cassette. 4,540,132, Cl. 242-67.10R.
Kubota, Ltd.: *See*—
Yamakami, Yoshiaki; and Yoshimitsu, Arata, 4,540,424, Cl. 65-100.000.
Kubota, Shouichi: *See*—
Rachi, Kazuo; Kubota, Shouichi; and Sasaki, Isamu, 4,540,589, Cl. 426-250.000.
Kubota, Tetuo: *See*—
Inoue, Makoto; Irie, Hirofumi; Kobayashi, Youichi; and Kubota, Tetuo, 4,540,323, Cl. 413-6.000.
Kucera, Helmut W.; and Saad, Samy K., to Textron, Inc. Water dispersible polyurethane adhesive compositions and adhesive layer formed therefrom. 4,540,633, Cl. 428-423.100.
Kudo, Masaki: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; Hatanaka, Masataka; Hirose, Masayoshi; and Kudo, Masaki, 4,540,706, Cl. 514-403.000.
Kugai, Katsutoshi: *See*—
Shibata, Setsuo; Koshiba, Yukihiko; Hamamoto, Yoshito; Kugai, Katsutoshi; Kawashima, Akiro; and Fujisawa, Hiroshi, 4,540,490, Cl. 210-323.200.
Kujawa, James R.: *See*—
Corrigall, Don J.; Hansen, Floyd D.; and Kujawa, James R., 4,540,871, Cl. 219-137.630.
Kukacka, Lawrence E.: *See*—
Sugama, Toshifumi; Kukacka, Lawrence E.; and Horn, William H., 4,540,726, Cl. 523-505.000.
Kulow, Howard H., to Rowan Corporation. Manually loaded envelope feeder. 4,540,298, Cl. 400-635.000.
Kumagai, Katuya: *See*—
Ishizawa, Akio; Hukaya, Toshio; Kumagai, Katuya; and Takeuchi, Tatuo, 4,540,627, Cl. 428-328.000.
Kun, Zoltan K.: *See*—
Gaida, Walter E.; and Kun, Zoltan K., 4,540,550, Cl. 422-109.000.
Kunii, Toshinobu: *See*—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,540,704, Cl. 514-389.000.
Kurahashi, Koichiro: *See*—
Nishi, Kazuro; Kurahashi, Koichiro; Hashimoto, Tsutomu; Senoo, Toshihiko; and Yamato, Shinji, 4,540,247, Cl. 350-3.710.
Kurandt, Hans-Friedrich, to Chemische Werke Huls Aktiengesellschaft. Process for preparation of gypsum shapes. 4,540,439, Cl. 106-109.000.
Kuraoka, Yasuo; and Sakao, Nobuo, to Hoxan Corporation. Apparatus for continuously freezing liver piece. 4,539,824, Cl. 62-380.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Takao; Tsuchiya, Tadashi; and Osaka, Yoshiaki, 4,540,702, Cl. 514-369.000.
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,540,689, Cl. 514-196.000.
Kurie, John R.; and Stanescu, Mircea S., to BOC Group, Inc., The. Furnace curtains. 4,540,362, Cl. 432-65.000.
Kuroki, Kazuo, to Fuji Electric Co., Ltd. Variable-frequency oscillation circuit. 4,540,945, Cl. 328-134.000.
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Yamanaka, Junichi; and Kusaka, Masataka, 4,540,918, Cl. 315-371.000.
Kustes, William A.; and Hausberger, Arthur L., to United Catalysts, Inc. Catalyst for the methanation of carbon monoxide in sour gas. 4,540,681, Cl. 502-234.000.
Kutcher, Howard R., to Aluminum Company of America. Container assembly including a tamper-indicating band. 4,540,101, Cl. 215-252.000.
Kuwabara, Kouji; Sasaki, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, to Hitachi, Ltd. Gas laser device with plural electrode members on the upper gas flow side. 4,541,097, Cl. 372-87.000.
Kuwajima, Teruaki: *See*—
Ito, Takeyasu; and Kuwajima, Teruaki, 4,540,733, Cl. 524-407.000.
Kuznicki, William J.: *See*—
Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., 4,540,908, Cl. 310-326.000.
Kuzuya, Susumu: *See*—
Imaizumi, Mamoru; and Kuzuya, Susumu, 4,540,297, Cl. 400-625.000.
Kvarnang, Roger. Machine for removing material from logs. 4,540,031, Cl. 144-2.00R.
Kyburz, Hans. Ski-transporting device. 4,540,198, Cl. 280-814.000.
Kyushu Refractories Co., Ltd.: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Shinoda, Noboru; Isono, Tetsusaburo; and Fujiwara, Kenji, 4,540,674, Cl. 501-97.000.
Lacour, Clement F.; and Latouche, Yannick, to Thomson CSF. Microwave mixer. 4,541,124, Cl. 455-327.000.
Lade, Robert W.: *See*—
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,541,001, Cl. 357-23.400.
Laffitte, David S.: *See*—
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Lahoda, Edward J., to Westinghouse Electric Corp. Recovery of boric acid from nuclear waste. 4,540,512, Cl. 252-629.000.
Lambert, Donald R., to United States of America, Energy. Rolling cuff flexible bellows. 4,540,203, Cl. 285-226.000.
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Atkins, Terrance J.; Field, Martin J.; and Lamirande, Donald J., 4,539,961, Cl. 123-468.000.
Lamperski, Heinrich; and Gerling, Paul, to Glyco Maschinenbau-GmbH. Split bearing shell. 4,540,294, Cl. 384-273.000.
Lamppa, Reid G.: *See*—
Myer, William J.; and Lamppa, Reid G., 4,540,592, Cl. 426-557.000.
Lampson, George P.: *See*—
Bertland, Alexander U.; and Lampson, George P., 4,540,669, Cl. 435-235.000.
Landa, Isaac: *See*—
Landa, Isaac J.; and Shideler, Ronald, 4,540,282, Cl. 356-328.000.
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Landry, Brian J. Transit fare box. 4,540,117, Cl. 232-7.000.
Lanerie, John. Vibratory screen separator. 4,540,485, Cl. 209-323.000.
Langer, Heimo J.: *See*—
Dunnavant, William R.; Gardikes, John J.; and Langer, Heimo J., 4,540,724, Cl. 523-143.000.
Langlois, Pierre: *See*—
Sautereau, Michel; Nicod, Roger; and Langlois, Pierre, 4,540,844, Cl. 174-3.000.
Langner, Carl, to Concast AG. Method and apparatus for bidirectional horizontal continuous casing. 4,540,037, Cl. 164-466.000.
Lanham, Albert F.; Cox, Michael G. C.; and Etheridge, Richard H., to Bryant & May Limited. Humidity resistant matches and process for the manufacture thereof. 4,540,419, Cl. 44-42.000.
Lapetina, Robert A.; and Jones, Howard P., to Edo Western Corporation. Method and apparatus for detecting the presence of liquid. 4,540,981, Cl. 340-618.000.
Larkin, John M.; Yeakey, Ernest L.; and Watts, Lewis W., Jr., to Texaco Inc. Aminopolyols from sugars. 4,540,821, Cl. 564-473.000.
Larko, Robert C.: *See*—
Ross, Robert H.; and Larko, Robert C., 4,540,363, Cl. 432-148.000.
Larsen, Erik R., to F. L. Smidth & Co. Device for raking a storage heap. 4,540,085, Cl. 198-519.000.
Larsen, William: *See*—
McCollum, William A.; and Larsen, William, 4,539,842, Cl. 73-168.000.
Larson, Clayton J.: *See*—
Munk, Benedikt A.; and Larson, Clayton J., 4,540,988, Cl. 343-728.000.
Larsson, Lars E., to Santrade Ltd. Rock drill. 4,540,200, Cl. 285-332.400.
LaSelva, A.: *See*—
Long, Ballard E., 4,539,923, Cl. 112-224.000.
Lathery, Willie M.: *See*—
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Latouche, Yannick: *See*—
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Charlton, Steven C.; Fleming, Roger L.; and Lau, Authur L. Y., 4,540,520, Cl. 260-396.00N.
Laufer, Helmut: *See*—
Djordjevic, Ilja; Eheim, Franz; and Laufer, Helmut, 4,539,964, Cl. 123-509.000.
LaValley Industrial Plastics, Inc.: *See*—
LaValley, Richard W., 4,540,457, Cl. 156-182.000.
LaValley, Richard W., to LaValley Industrial Plastics, Inc. Butterfly valve with pressurized O-ring sale. 4,540,457, Cl. 156-182.000.
Lawrence, James, to Sanders Associates, Inc. Releasable pen block guide. 4,540,994, Cl. 346-139.00R.
Lawton, John V.: *See*—
Gilvary, John P.; and Lawton, John V., 4,540,731, Cl. 524-269.000.

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Johnston, Robert J.; Layciak, Stephen G.; and Colista, Dominic, 4,539,860, Cl. 74-483.0PB.

Leach, Jack. to Burlington Industries, Inc. Geotextile fabric construction. 4,540,311, Cl. 404-72.000.

Lebecque, Maurice. Multi-level stand, in particular multi-layer cakes. 4,539,914, Cl. 108-94.000.

Lechler GmbH & Co. KG: *See—*
Junger, Martin; and Floegel, Karl, 4,540,123, Cl. 239-102.000.

Lechner, Heinz: *See—*
Taillens, Jean-Francois; and Lechner, Heinz, 4,540,977, Cl. 340-552.000.

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Ledeen, Howard L.; and Ledeen, William P., 4,540,025, Cl. 137-625.320.

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Sakai, Kunikazu; Tunemoto, Daici; Kobori, Takeo; and Kondo, Kiyosi, 4,540,794, Cl. 548-127.000.

Lee, Charles K.; Peters, Rex B.; and Gogic, Aleksandar M., to Sundstrand Data Control, Inc. Counting apparatus and method for frequency sampling. 4,541,105, Cl. 377-19.000.

Lee, Minyoung; Reed, William R., Jr.; and Szala, Lawrence E., to General Electric Company. High-speed metal cutting method and self-sharpening tool constructions and arrangements implementing same. 4,539,875, Cl. 82-1.00C.

Lee, Rock S.: *See—*
Cheng, Richard M. H.; and Lee, Rock S., 4,540,289, Cl. 366-274.000.

Lee, Sam S.: *See—*
Arzoumanidis, Gregory G.; and Lee, Sam S., 4,540,679, Cl. 502-111.000.

Leech, Howard E.: *See—*
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Lefebvre, Guy, to Dynamold International. Installation for the fusion of metal ingots. 4,540,161, Cl. 266-95.000.

Leibenzeder, Siegfried; and Weyrich, Claus, to Siemens Aktiengesellschaft. Method for manufacturing a luminescent diode having a high frequency and high limit frequency for its modulation capability. 4,540,451, Cl. 148-173.000.

Leins, Eberhard; and Walter, Manfred, to Sulzer Morat GmbH. Knitting machine. 4,539,826, Cl. 66-64.000.

Lemmer, Helmut, to Starkstrom Gummersbach GmbH. Convertible normally closed/normally open switch with cam actuator. 4,540,859, Cl. 200-6.00B.

Lenke, Dieter: *See—*
Franke, Albrecht; Muller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Gunther; Muller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,540,697, Cl. 514-255.000.

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Leo, Reinhard W. Apparatus for producing a wound coil of an elastic material. 4,540,360, Cl. 425-384.000.

Lerner, Michael: *See—*
Gorney, Moshe; Lerner, Michael; and Shavit, Amos, 4,540,125, Cl. 239-232.000.

Lerum, Robert D.: *See—*
Swanson, Dennis E.; and Lerum, Robert D., 4,540,301, Cl. 401-146.000.

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Borovian, Gayle E., 4,540,570, Cl. 424-78.000.
Moran, David P. J.; and Campbell, Iain J., 4,540,593, Cl. 426-603.000.
Oneto, Francis E. J.; and Vermersch, Marc, 4,540,567, Cl. 424-45.000.

Levinson, Leo, to Xerox Corporation. Cassette sheet feed apparatus. 4,540,169, Cl. 271-127.000.

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Lewandowski, Reiner, to Pfister GmbH. Method and apparatus for checking the functions of a display system. 4,541,066, Cl. 364-580.000.

Lewis, Arthur E.: *See—*
Mallon, Richard G.; Walton, Otis R.; Lewis, Arthur E.; and Braun, Robert L., 4,539,917, Cl. 110-256.000.

Libkie, Herbert A.: *See—*
Meloche, /Kenneth R.; McLeish, James G.; and Libkie, Herbert A., 4,540,188, Cl. 280-6.00R.

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Gochermann, Hans; Schmidt, Wilfried; Rasch, Klaus-Dieter; and Tentscher, Karl-Heinz, 4,540,843, Cl. 136-251.000.
Kerpers, Werner; Bonk, Werner; Roser, Dieter; and Fuhrer, Hans-Jurgen, 4,539,737, Cl. 29-423.000.

Liebing, Lothar, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Plasma gun that reduces cathode contamination. 4,540,868, Cl. 219-121.0PM.

Lietz, Helmut: *See—*
Franke, Albrecht; Muller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Gunther; Muller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,540,697, Cl. 514-255.000.

Light, David N.: *See—*
Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; Gasdik, Charles E.; Light, David N.; and Pickar, Paul B., 4,540,473, Cl. 204-52.00R.

Lilje, Kenneth C., to Ethyl Corporation. Fluoronitroaralkyloxazolines, derivatives thereof, and nucleophilic substitution processes for preparing them. 4,540,795, Cl. 548-239.000.

Lillis, William J.: *See—*
Early, Adrian B.; and Lillis, William J., 4,540,900, Cl. 307-289.000.

Lin, Lifun, to Olin Corporation. Apparatus for producing acicular or equiaxed iron or iron alloy particles. 4,540,477, Cl. 204-242.000.

Lincourt, William R. Jack stand attachment. 4,540,147, Cl. 248-352.000.

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Gehring, Fritz; and Hofmaier, Gerhard, 4,540,028, Cl. 139-453.000.

Lindner, Walter E.: *See—*
Coggins, Dolphus L.; and Lindner, Walter E., 4,540,465, Cl. 156-642.000.

Lindow, Steven: *See—*
Orser, Cindy; Loper, Joyce; Panopoulos, Nickolas; Lindow, Steven; and Schroth, Milton N., 4,540,667, Cl. 435-172.300.

Ling, Daniel T.: *See—*
Dill, Frederick H.; Ling, Daniel T.; and Matick, Richard E., 4,541,075, Cl. 365-189.000.

Link, Achim, to Fichtel & Sachs AG. Multiple disk clutch for motor vehicles. 4,540,079, Cl. 192-109.00R.

Linker, Frank V.; and Linker, Frank V., Jr., to American Tech. Manufacturing, Inc. Method and apparatus for trimming the leads of electronic components. 4,539,878, Cl. 83-99.000.

Linker, Frank V., Jr.: *See—*
Linker, Frank V.; and Linker, Frank V., Jr., 4,539,878, Cl. 83-99.000.

Lion Corporation: *See—*
Sakatani, Takenobu; and Suzuki, Shigeru, 4,540,499, Cl. 252-8.750.

Lischke, Burkhard: *See—*
Plies, Erich; Weyl, Reinhard; and Lischke, Burkhard, 4,540,885, Cl. 250-310.000.

Litman, David J.; and Ullman, Edwin F., to Syva Company. Simultaneous calibration heterogeneous immunoassay. 4,540,659, Cl. 435-7.000.

Litzie, Ken; and Roberts, Craig P. Emergency bypass system. 4,540,399, Cl. 607-4.000.

Livingston, Waylon A. Process for ultrasonic testing of tubular goods. 4,541,064, Cl. 364-552.000.

Lloyd, Ronald, to Smith and Nephew Associated Companies Limited. Applicators for pharmacologically active agents, their preparation and use. 4,540,408, Cl. 604-294.000.

Lobach, Ernst: *See—*
Mayer, Herbert; and Lobach, Ernst, 4,540,277, Cl. 355-53.000.

Lockard, L.: *See—*
Long, Ballard E., 4,539,923, Cl. 112-224.000.

Lockheed Missiles & Space Company, Inc.: *See—*
Maple, T. Grant, 4,540,914, Cl. 313-466.000.

Logan, Emanual L., Jr.; Sommers, Walter M.; and Walsh, J. William, to Reliable Security Systems, Inc. Point-of-egress control device for safely securing emergency exit doors. 4,540,208, Cl. 292-341.190.

Lolachi, Houshang; Mathieu, Bernd; and Weber, Wolfram, to Fresenius AG. Centrifugal apparatus. 4,540,397, Cl. 494-84.000.

Lolic, Srboslav, to Grote & Hartmann GmbH & Co. KG. Double flat spring contact provided with an over-spring. 4,540,235, Cl. 339-259.00F.

London, Jasper R.: *See—*
Bell, Cecil R., Jr.; Lathery, Willie M.; Patel, Navin D.; and London, Jasper R., 4,539,924, Cl. 112-262.200.

Long, Ballard E., to LaSelva, A.; Lockard, L.; and Roberts, E. Self-threading needle. 4,539,923, Cl. 112-224.000.

Longchamp, Jean-Francois: *See—*
Hopf, Reinhard; and Longchamp, Jean-Francois, 4,541,110, Cl. 381-46.000.

Longley, Kermit D.; and Karalis, Anastasios, to Witco Chemical Corporation. Aromatic base poly-sulfosuccinate esters. 4,540,807, Cl. 560-151.000.

Longoni, Angelo: *See—*
Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, 4,540,711, Cl. 514-720.000.

Lonza, Ltd.: *See—*
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Loomis, Gary L., to Du Pont de Nemours, E. I., and Company. Process for making foamed, sulfur-cured polymer blend compositions. 4,540,719, Cl. 521-89.000.

Loper, Joyce: *See—*
Orser, Cindy; Loper, Joyce; Panopoulos, Nickolas; Lindow, Steven; and Schroth, Milton N., 4,540,667, Cl. 435-172.300.

L'Oreal: *See—*
Grollier, Jean F., 4,540,507, Cl. 252-174.230.

Lortie, Richard P.; and Adams, William R., to R. J. Reynolds Tobacco Company. Variable air volume air conditioning system. 4,540,118, Cl. 236-44.00C.

Lougheed, Robert M., to Environmental Research Institute of MI. Neighborhood image processing stage for implementing filtering operations. 4,541,116, Cl. 382-49.000.

Lougheed, Robert M.: *See—*
Rutenbar, Robin A.; and Lougheed, Robert M., 4,541,114, Cl. 382-8.000.

Loughran, James A.: *See—*
Carlson, Richard O.; Glascock, Homer H., II; Loughran, James A.; and Webster, Harold F., 4,541,035, Cl. 361-414.000.

Lowe, Lawrence A.: *See*—
Hardy, George W.; Lowe, Lawrence A.; and Smith, Terence W., 4,540,682, Cl. 514-18.000.
LRV Corporation: *See*—
Wagner, James A., 4,540,214, Cl. 296-39.00R.
LTV Aerospace and Defense Co.: *See*—
Nelson, Roy A., 4,539,786, Cl. 52-645.000.
Lucas Industries Public Limited Company: *See*—
Osborne, Colin T., 4,540,939, Cl. 324-127.000.
Redston, Hugh W.; and Potter, James C., 4,540,155, Cl. 251-129.200.
Luchaco, David G.; and Ference, Jonathan H., to Lutron Electronics Co., Inc. Pulse network for fluorescent lamp dimming. 4,540,917, Cl. 315-291.000.
Luchsinger, Patrick M.: *See*—
Jackson, Robert C.; and Luchsinger, Patrick M., 4,540,540, Cl. 264-272.110.
Luker, Edward, to Sunbeam Plastics Corporation. Tamper indicating child resistant closure. 4,540,098, Cl. 215-216.000.
Lundberg, Robert D.: *See*—
Peiffer, Dennis G.; Lundberg, Robert D.; Walker, Thad O.; and Turner, S. Richard, 4,540,496, Cl. 252-8.50A.
Lundblad, Leif. Apparatus for treating back ailments. 4,539,978, Cl. 128-71.000.
Lundstrom, Kristian V., to Tamefelt Oy AB. Method of cleaning a drying wire in a paper making machine. 4,540,469, Cl. 162-199.000.
Lutenegger, Alan J., to Iowa State University Research Foundation, Inc. Soil and rock shear tester. 4,539,851, Cl. 73-845.000.
Luteri, George F.: *See*—
Nickell, Louis G.; Stach, Leonard J.; and Luteri, George F., 4,540,431, Cl. 71-107.000.
Lutron Electronics Co., Inc.: *See*—
Luchaco, David G.; and Ference, Jonathan H., 4,540,917, Cl. 315-291.000.
Lynch, Conrad L.; and Tobias, Michael A., to Valspar Corporation, The. High solids, high heat resistant polyester resins and coating compositions containing the same. 4,540,751, Cl. 525-517.500.
Maag Gear-Wheel & Machine Company Limited: *See*—
Donner, Meinrad, 4,539,779, Cl. 51-325.000.
Mac Iver, Bernard A.; Erskine, James C., Jr.; and Bierlein, John C., to General Motors Corporation. Metal bearing element with a score-resistant coating. 4,540,636, Cl. 428-610.000.
Mackiewicz, John E.; and Martinic, Jack, to Allied Corporation. Hydraulic brake booster. 4,539,892, Cl. 91-391.00R.
MacLeod, Robert B., Jr.: *See*—
Gelardi, Paul J.; and MacLeod, Robert B., Jr., 4,540,090, Cl. 206-387.000.
Madden, James J., to AT&T Bell Laboratories. Electrical interconnection apparatus. 4,540,229, Cl. 339-75.00M.
Maddocks, Keith L., to KMG Systems Limited. Vibratory distribution system. 4,540,082, Cl. 198-358.000.
Madello, Kenneth L.: *See*—
Jacobson, James W.; Glick, J. Leslie; and Madello, Kenneth L., 4,540,506, Cl. 252-174.120.
Madia, Ashwin: *See*—
Johnson, Eric A.; Demain, Arnold L.; and Madia, Ashwin, 4,540,664, Cl. 435-99.000.
Madonio, Andrew M.; and Gulick, Michael H., to General Motors Corporation. Locking mechanism for vehicle door. 4,539,775, Cl. 49-255.000.
Mae, Hisao: *See*—
Kobayashi, Hideo; Kashiwagi, Takao; Yoshimura, Kunimasa; and Mae, Hisao, 4,539,942, Cl. 123-41.100.
Maeda Kiko Company Limited: *See*—
Michiharu, Tsukai, 4,540,319, Cl. 408-100.000.
Maeda, Kunihiro: *See*—
Takeda, Yukio; Ogihara, Satoru; Ura, Mitsuru; Nakamura, Kousuke; Asai, Tadamichi; Ohkoshi, Tokio; Matsushita, Yasuo; and Maeda, Kunihiro, 4,540,673, Cl. 501-96.000.
Maeda, Takeo: *See*—
Torii, Michihiro; Kosaka, Tomoyoshi; Maeda, Takeo; and Rikukawa, Hiroshi, 4,540,500, Cl. 252-62.580.
Maeda, Takeshi; Uno, Motoo; and Takasago, Masahiro, to Hitachi, Ltd. For jumping a light spot on a track of a recording medium. 4,541,083, Cl. 369-44.000.
Maestroni, Georges: *See*—
Pierpaoli, Walter; and Maestroni, Georges, 4,540,574, Cl. 424-95.000.
Magg, Alfred; and Griesser, Walter, to Zahnradfabrik Friedrichshafen AG. Clutch assembly for gear transmission. 4,540,074, Cl. 192-53.00G.
Magrath, Joseph M. Aspirator and resuscitator for newborn animals. 4,539,985, Cl. 128-205.130.
Mahnke, Harald; Woerner, Frank P.; Weber, Heinz; and Kreibiehl, Guenter, to BASF Aktiengesellschaft. Resilient foam based on a melamine-formaldehyde condensate. 4,540,717, Cl. 521-52.000.
Maier, Alfred E., to Westinghouse Electric Corp. Molded case circuit breaker with an apertured molded cross bar for supporting a movable electrical contact arm. 4,540,961, Cl. 335-16.000.
Maier, Peter. Guide plate for a hand power saw. 4,539,881, Cl. 83-745.000.
Maillart, Patrick: *See*—
Brice, Jean-Michel; and Maillart, Patrick, 4,541,073, Cl. 365-156.000.
Majewski, Frank. Animal door scratch preventer. 4,539,936, Cl. 119-29.000.
Malek, Edward J., to S. C. Johnson & Son, Inc. Method of forming a burstable pouch. 4,539,793, Cl. 53-469.000.
Malizio, Andrew B.: *See*—
Battle, Billy J.; Graham, Robert M.; Jones, Lawrence S.; Malizio, Andrew B.; and Rhodes, George F., 4,540,204, Cl. 285-231.000.
Mallok, Horst; Brown, Howard; and Iacampo, Marco, to RDC Electronics Inc. Plating rack. 4,540,478, Cl. 204-297.00W.
Mallon, Richard G.; Walton, Otis R.; Lewis, Arthur E.; and Braun, Robert L., to United States of America, Energy. Combustion heater for oil shale. 4,539,917, Cl. 110-256.000.
Maloney, John, to Johnsen & Jorgensen Jaypak Limited. Bag and bag making apparatus. 4,540,089, Cl. 206-219.000.
Manabe, Shunichi: *See*—
Hattori, Masaichi; Hara, Shigeo; and Manabe, Shunichi, 4,540,965, Cl. 335-259.000.
Manabe, Sugio, to Olympus Optical Company Ltd. Chemical analyzing apparatus. 4,540,549, Cl. 422-64.000.
Mann, Horst: *See*—
Wegner, Karl-Heinz; Hodes, Erich; and Mann, Horst, 4,540,630, Cl. 428-408.000.
Mannesmann Rexroth GmbH: *See*—
Dantlgraber, Jorg, 4,540,018, Cl. 137-540.000.
Manriquez, Ralph F.: *See*—
Campbell, Bryant A.; DuBois, Dale R.; Manriquez, Ralph F.; and Miller, Nicholas E., 4,539,933, Cl. 118-719.000.
Mans, Thomas A., to Datascope Corp. Method and device for subtracting a pacer signal from an ECG signal. 4,539,999, Cl. 128-696.000.
Mansfield, Graham J.: *See*—
Peck, Alan M.; Reedman, David C.; Graveling, Frederick J.; Moore, David; and Mansfield, Graham J., 4,541,054, Cl. 364-474.000.
Manson, Harry G., to IMC Magnetics Corp. Method of assembling a motor having stationary shaft. 4,539,745, Cl. 29-596.000.
Maple, T. Grant, to Lockheed Missiles & Space Company, Inc. Absorbing graded nitride film for high contrast display devices. 4,540,914, Cl. 313-466.000.
Maranell, M. C.; and Kortlever, LeRoy A. Leak resistant poultry watering device. 4,539,938, Cl. 119-75.000.
Marchant, John, to Jeviti Pty. Limited. Work table. 4,539,913, Cl. 108-7.000.
Marchent, Brian G.; and Foster, Michael R., to Plessey Overseas Ltd. Compass. 4,539,760, Cl. 33-356.000.
Mardin, Mithat; Busse, Wolf-Dieter; Hoffmeister, Friedrich; Seuter, Friedel; Perzborn, Elisabeth; Schlossmann, Klaus; Mayer, Dieter; and Fiedler, Volker, to Bayer Aktiengesellschaft. Nafazatrom as a lipoxygenase inhibitor. 4,540,707, Cl. 514-404.000.
Marhoefer, Michael, to Bodine Electric Company. Closed loop resonance compensation circuit for stepper motors. 4,540,928, Cl. 318-696.000.
Maros, Ronald R., to Cooper Industries, Inc. Grounding clip for use with shielded, jacketed flat cable. 4,540,224, Cl. 339-14.00R.
Martel, Jacques; Tessier, Jean; and Teche, Andre , to Roussel Uclaf. Process for resolution of chiral alcohols or phenols or chiral lactonic compounds. 4,540,797, Cl. 549-302.000.
Marten, James F., to Applied Immune Sciences, Inc. In vivo therapeutic apheresis using lipid vesicles. 4,540,401, Cl. 604-28.000.
Martin, Paul, to Diesel Equipment Limited. Safety lock for tailgate lift. 4,540,329, Cl. 414-545.000.
Martinic, Jack: *See*—
Mackiewicz, John E.; and Martinic, Jack, 4,539,892, Cl. 91-391.00R.
Marukokeihouki Co., Ltd.: *See*—
Kobayashi, Shigeru, 4,540,975, Cl. 340-388.000.
Maruyama, Masanori; Fukushima, Masakazu; Kato, Shinichi; and Ogusu, Chihaya, to Nippon Hoso Kyokai; and Hitachi, Ltd. Electron gun for television camera tube. 4,540,916, Cl. 315-16.000.
Marvin Glass & Associates: *See*—
Rehkemper, Steven F.; Hanson, Steven P.; and Disko, Harry, 4,540,377, Cl. 446-430.000.
Maschinenfabrik Fr. Niepmann GmbH & Co.: *See*—
Stewart, Iain G. H.; and Pitz, Hans P., 4,540,459, Cl. 156-504.000.
Massachusetts Institute of Technology: *See*—
Bell, Eugene, 4,539,716, Cl. 623-1.000.
Massardo, Pietro: *See*—
Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, 4,540,711, Cl. 514-720.000.
Massengeil, Hans A.; Overmeer, Robert; Pietruska, Joachim; and Caufriez, Jean J., to AGFA-Gevaert AG. Automatic feeder. 4,540,166, Cl. 271-3.100.
Masserang, Gregory J., to Android Corporation. Jaw assembly. 4,540,211, Cl. 294-88.000.
Masuda, Shunichi; Furuichi, Katsushi; and Takahata, Naomi, to Canon Kabushiki Kaisha. Paper feed control device. 4,540,170, Cl. 271-259.000.
Matesco, Michel G. P., to Eyquem. Sparking-plug. 4,540,912, Cl. 313-142.000.
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Lolachi, Houshang; Mathieu, Bernd; and Weber, Wolfram, 4,540,397, Cl. 494-84.000.
Matick, Richard E.: *See*—
Dill, Frederick H.; Ling, Daniel T.; and Matick, Richard E., 4,541,075, Cl. 365-189.000.
Matsui, Toshikazu: *See*—
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Konishi, Hiroyuki; Hino, Naganori; Matsumoto, Hiroshi; and Yoshida, Ryo, 4,540,824, Cl. 568-45.000.
Matsumoto, Toshiaki; and Taniguchi, Nobuyuki, to Minolta Camera. Film transporting device for use in a camera. 4,540,261, Cl. 354-173.110.
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Hara, Seinosuke; Miisho, Kazuyuki; Matsumoto, Yasuo; and Yoshikawa, Yasuo, 4,539,951, Cl. 123-90.170.
Matsuo, Jon T., to United States of America, Navy. Reefing system. 4,540,145, Cl. 244-152.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kohashi, Tadao, 4,541,042, Cl. 346-76.0PH.
Nukina, Yasuyuki; Namikawa, Syunji; Tomioka, Toshikazu; Yamamoto, Takehiko; and Oi, Susumu, 4,540,666, Cl. 435-167.000.
Saka, Hiroshi, 4,541,123, Cl. 455-325.000.
Shiragasawa, Tsuyoshi, 4,541,090, Cl. 371-21.000.
Suzuki, Takashi; Hibino, Kunio; Murai, Mikio; Kawase, Shigeki; and Shinohara, Koichi, 4,540,618, Cl. 428-141.000.
Matsushita, Yasuo: *See*—
Takeda, Yukio; Ogihara, Satoru; Ura, Mitsuru; Nakamura, Kousuke; Asai, Tadamichi; Ohkoshi, Tokio; Matsushita, Yasuo; and Maeda, Kunihiro, 4,540,673, Cl. 501-96.000.
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Matthews, Paul G., to AT&T Bell Laboratories. Instruction system topic-interpreting method. 4,541,056, Cl. 364-300.000.
Matthews and Yates Limited: *See*—
Wilson, David J., 4,540,421, Cl. 55-432.000.
Matthies, Paul: *See*—
Pipper, Gunter; Schmidt, Franz; Theysohn, Rainer; Riegger, Siegfried; Heil, Eduard; Fischer, Hermann; Thoma, Richard; and Matthies, Paul, 4,540,772, Cl. 528-335.000.
Mattson, James A.: *See*—
Wehr, Michael A.; and Mattson, James A., 4,540,033, Cl. 144-34.00R.
Mattsson, Mats: *See*—
Beijar, Ole; and Mattsson, Mats, 4,540,848, Cl. 174-152.00R.
Matzner, Markus; and Papuga, Donald M., to Union Carbide Corporation. Polyetherimides. 4,540,748, Cl. 525-420.000.
Mauck, Lee E. Life preserver. 4,540,372, Cl. 441-81.000.
Mautner, Jacob E.; Crennan, Gerard; and Anderson, Arnold N. Top-mounted double-action door hinge. 4,539,727, Cl. 16-285.000.
Maxi-Lift, Inc.: *See*—
Ramsey, Earl A., 4,540,389, Cl. 474-257.000.
Maxilin B.V.: *See*—
Paping, Max G.; and Goossens, Bjorn O., 4,540,196, Cl. 280-646.000.
May, Jim. Portable knock-down canopy. 4,540,010, Cl. 135-99.000.
Mayer, Dieter: *See*—
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Mayer, Herbert; and Lobach, Ernst, to Perkin-Elmer Censor Anstalt. Device for the projection printing of masks into a workpiece. 4,540,277, Cl. 355-53.000.
Mayer, Robert A.; Reith, Michael W.; and Odell, Jack L., II, to Western Gear Corporation. System for recording the locations of workpiece defects. 4,541,011, Cl. 358-106.000.
Mayhew, Harry W.; French, Richard J.; and Rekers, Louis J., to National Petro Chemicals Corporation. Inclusion of oxygen in the polymerization of olefins. 4,540,755, Cl. 526-100.000.
Maykel, William M. Measurement of peripheral strength. 4,539,756, Cl. 33-515.000.
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Boudot, Jean E.; Mazeau, Jean P.; and Prassas, Michel, 4,540,672, Cl. 501-65.000.
McCaffrey, Eugene F.; Dieterman, Alfred J.; and Knazko, Luba, to National Distillers and Chemical Corporation. Defoamer and processing aid for wet process phosphoric acid. 4,540,511, Cl. 252-321.000.
McCall, Kenneth E.: *See*—
Johnson, David E.; and McCall, Kenneth E., 4,540,225, Cl. 339-16.0RC.
McCarthy, James R. Method and apparatus for separating selected particulate materials from a mixture of liquids and solids. 4,540,484, Cl. 209-5.000.
McCollum, William A.; and Larsen, William, to Accu Tech Associates, Inc. Spray pattern analyzer. 4,539,842, Cl. 73-168.000.
McConnell, Richard L.: *See*—
Meyer, Max F., Jr.; Bond, Gary L.; and McConnell, Richard L., 4,540,749, Cl. 525-437.000.
McCord, Kenneth R.; Bullock, James K.; Gille, Henrick K.; and Gilroy, Keith, to American Hospital Supply Corporation. Pressure transducer assembly. 4,539,998, Cl. 128-675.000.
McCoy, Leon A. Device for transporting loads between various elevations. 4,539,781, Cl. 52-183.000.
McCulloch, Dean E., to General Motors Corporation. Motor vehicle power output regulation control system. 4,541,052, Cl. 364-431.070.
McDaniel, Max P., to Phillips Petroleum Company. Polymerization and catalyst. 4,540,757, Cl. 526-128.000.
McDonald, Robert C.; Wang, Wei-Tao; Cukor, Peter; and Rubner, Michael F., to GTE Communications Products Corporation; and GTE Laboratories Incorporated. Electrochemical cell. 4,540,641, Cl. 429-105.000.
McDonnell Douglas Corporation: *See*—
Coggins, Dolphus L.; and Lindner, Walter E., 4,540,465, Cl. 156-642.000.
McFadden, Russell T., to Dow Chemical Company, The. Epoxy coating compositions with improved weatherability. 4,540,752, Cl. 525-531.000.
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Keyworth, Donald A.; and McFarland, Cecil G., 4,540,839, Cl. 585-520.000.
McGinty, Gordon K., to U.S. Philips Corporation. Furnace suitable for heat-treating semiconductor bodies. 4,540,876, Cl. 219-405.000.
McGonigal, Charles: *See*—
Brown, Robert J.; Fernandez, Douglas R.; and McGonigal, Charles, 4,539,748, Cl. 29-874.000.
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Ambrose, Ronald R.; Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., 4,540,771, Cl. 528-272.000.
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McKie, Robert T. Hydraulic carriage drive system. 4,539,814, Cl. 60-413.000.
McLean, Kenneth W., to Sperry Corporation. Method and apparatus for checking lubricant volume in a disc cutterbar. 4,539,797, Cl. 56-12.300.
McLeish, James G.: *See*—
Meloche, /Kenneth R.; McLeish, James G.; and Libkie, Herbert A., 4,540,188, Cl. 280-6.00R.
McManama, Charles E. Logging trailer. 4,540,328, Cl. 414-538.000.
Medtronic, Inc.: *See*—
Stanton, David J., 4,539,993, Cl. 128-421.000.
Meile, Hanspeter; and Pietrini, Viktor, to Rieter Machine Works Ltd. Apparatus for the continuous compression or determination of the mass of a fiber sliver. 4,539,729, Cl. 19-288.000.
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Szlam, Aleksander; and Quinn, Chester P., 4,540,855, Cl. 179-84.00R.
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Seth, Pyare, 4,540,572, Cl. 424-81.000.
Mercer, Larry D., to Huck Manufacturing Company. Method of making a multigrip fastener and fastener made thereby. 4,540,447, Cl. 148-2.000.
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Bertland, Alexander U.; and Lampson, George P., 4,540,669, Cl. 435-235.000.
Chang, Michael N.; and Hwang, San-Bao, 4,540,709, Cl. 514-470.000.
Monaghan, Richard L.; and Kong, Yu-Lin, 4,540,575, Cl. 424-115.000.
Prugh, John D., 4,540,796, Cl. 549-292.000.
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Kieser, Manfred, 4,540,730, Cl. 524-230.000.
Klug, Rudolf; Hartner, Hartmut; Merrem, Hans-Joachim; and Neisius, Karl H., 4,540,650, Cl. 430-281.000.
Merl, Milton J.; and Di Marchi, Silvio J. Display hook apparatus. 4,540,093, Cl. 211-59.100.
Merrell Dow Pharmaceuticals Inc.: *See*—
Seiler, Nikolaus; and Sarhan, Shakir, 4,540,582, Cl. 514-561.000.
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Hassel, Helmut; and Stark, Reimund, 4,539,912, Cl. 105-8.00R.
Messerschmitt, Elmar. Tensioning device for the screen fabric in silk screen printing frames. 4,539,734, Cl. 24-460.000.
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Veaux, Jacques; and Derrien, Michel, 4,540,142, Cl. 244-102.00R.
Metallgesellschaft AG: *See*—
Wolfsgruber, Friedrich; Weiser, Ernst A.; Gmohling, Werner; Kern, Hans; and Reifferscheid, Karl J., 4,540,436, Cl. 75-130.00A.
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Hirsch, Martin; Fischer, Peter; and Serbent, Harry, 4,540,432, Cl. 75-43.000.
METCO, Inc.: *See*—
Waszkiewicz, Richard A., 4,540,120, Cl. 239-1.000.
Meyer, Fred. Combination pet bed and enclosure. 4,539,935, Cl. 119-1.000.
Meyer, Max F., Jr.; Bond, Gary L.; and McConnell, Richard L., to Eastman Kodak Company. Adhesive blends. 4,540,749, Cl. 525-437.000.
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Meyer, Willy, to Ciba-Geigy Corporation. Fluoroalkoxy-aminotriazines. 4,540,782, Cl. 544-194.000.
Meynier, Guy, to Societe Anonyme D.B.A. Braking system incorporating at least one sliding brake disc and brake disc for such a braking system. 4,540,067, Cl. 188-71.500.
Miale, Joseph N.; and Chang, Clarence D., to Mobil Oil Corporation. Catalysis over activated high silica zeolites. 4,540,840, Cl. 585-640.000.

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Mickelson, Elliot S.: *See*—
Campbell, Clarence R.; Mickelson, Elliot S.; and Baumgartner, Steven A., 4,540,357, Cl. 425-28.00B.
Microdot Inc.: *See*—
Berecz, Imre, 4,540,321, Cl. 411-310.000.
Micronix Partners: *See*—
Kadi, Frank G., 4,540,240, Cl. 350-255.000.
Midgley, Charles A., to Polysar Limited. Adhesive polymer latex. 4,540,739, Cl. 524-764.000.
Midorikawa, Yoshio, to Toyo Polymer Co., Ltd.; and Kotobuki & Co., Ltd. Retractable capless marking pen. 4,540,300, Cl. 401-107.000.
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Knoth, Norbert; and Miehe, Friedrich V., 4,541,053, Cl. 364-466.000.
Mihelich, Peter, to Grumman Aerospace Corporation. Wire coil production system. 4,540,029, Cl. 140-92.200.
Miisho, Kazuyuki: *See*—
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Miles, Clive, to Thoratec Laboratories Corporation. Anticoagulant delivery system for use with an auto-transfusion system. 4,540,406, Cl. 604-269.000.
Miles Laboratories, Inc.: *See*—
Charlton, Steven C.; Fleming, Roger L.; and Lau, Authur L. Y., 4,540,520, Cl. 260-396.00N.
Miller Electric Manufacturing Company: *See*—
Corrigall, Don J.; Hansen, Floyd D.; and Kujawa, James R., 4,540,871, Cl. 219-137.630.
Miller, Gabriel M.; Cowen, Timothy B.; and Palin, Philip R., to Cilco, Inc. Disposable syringe sleeve. 4,540,405, Cl. 604-232.000.
Miller, James C.: *See*—
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Miller, Kenneth L.: *See*—
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Campbell, Bryant A.; DuBois, Dale R.; Manriquez, Ralph F.; and Miller, Nicholas E., 4,539,933, Cl. 118-719.000.
Miller, Robert E.: *See*—
Bodmer, Jerome R.; and Miller, Robert E., 4,540,998, Cl. 346-212.000.
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Geary, David F.; Honchar, Dennis R.; and Miller, Robert P., 4,540,637, Cl. 428-626.000.
Miller, William S.: *See*—
Dickerson, Richard C.; and Miller, William S., 4,540,493, Cl. 210-669.000.
Millipore Corporation: *See*—
Kessler, Stephen B., 4,540,492, Cl. 210-651.000.
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Minerd, Timothy M.; and Crumrine, Robert E., to Xerox Corporation. High contrast ratio paper sensor. 4,540,887, Cl. 250-561.000.
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Bent, John H., deceased; and Bent, Paul, executor, 4,540,110, Cl. 227-8.000.
Bunker, James E., 4,540,722, Cl. 523-109.000.
Burbank, John E., III, 4,540,257, Cl. 353-103.000.
Chang, John C.; and Howells, Richard D., 4,540,497, Cl. 252-8.800.
Engel, Michael R., 4,539,996, Cl. 128-640.000.
Fox, Bryce J., 4,539,816, Cl. 62-87.000.
Schoon, David J., 4,541,061, Cl. 364-518.000.
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Matsumoto, Toshiaki; and Taniguchi, Nobuyuki, 4,540,261, Cl. 354-173.110.
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,540,262, Cl. 354-195.130.
Misawa, Yutaka: *See*—
Hidaka, Toshiyuki; Sakamoto, Hisashi; Fukuhara, Toshiaki; Fujieda, Sadao; and Misawa, Yutaka, 4,540,603, Cl. 427-82.000.
Mita Industrial Co Ltd: *See*—
Honda, Nobuyasu; Matsui, Toshikazu; Fushida, Akira; Ikeda, Toshimitsu; Takahashi, Kenji; Fukuda, Hideo; Kamezaki, Yasushi; and Teshima, Takashi, 4,540,645, Cl. 430-122.000.
Mita Kogyo Kabushiki Kaisha: *See*—
Irie, Yoichiro; Shigemura, Yutaka; and Namba, Satoshi, 4,540,279, Cl. 355-69.000.
Mitchell, Howard L., III: *See*—
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Mitel Corporation: *See*—
Beirne, Patrick R., 4,540,854, Cl. 179-18.0FA.
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Chitose, Takashi, 4,540,967, Cl. 336-84.00C.
Ishii, Takashi, 4,540,913, Cl. 313-466.000.
Kimura, Hiroshi, 4,540,502, Cl. 252-70.000.
Nishi, Kazuro; Kurahashi, Koichiro; Hashimoto, Tsutomu; Senoo, Toshihiko; and Yamato, Shinji, 4,540,247, Cl. 350-3.710.
Okumura, Mitsuhiro; Naya, Eizo; Yorita, Mitsumasa; and Takeya, Yasushi, 4,540,861, Cl. 200-144.00B.
Takeda, Masatoshi, 4,540,895, Cl. 307-252.00Q.
Yasuoka, Hirotoshi, 4,540,869, Cl. 219-124.340.
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Fukumoto, Ryutaro; Oyagi, Shuji; Yoshida, Yukio; and Akimoto, Ryosaku, 4,540,040, Cl. 165-12.000.
Yamaguchi, Nobuyuki; and Sugano, Hiroshi, 4,540,335, Cl. 415-129.000.
Mitsuboshi Belting Ltd.: *See*—
Shimazaki, Masahiro, 4,540,113, Cl. 228-1.100.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Ishikawa, Katsutoshi; Shimotori, Hitoshi; Iida, Noborū; Akihiro, Kazuo; and Ozawa, Shuji, 4,540,698, Cl. 514-270.000.
Yamaguchi, Keizaburo; Sugimoto, Kenichi; Tanabe, Yoshimitsu; Kawashima, Saburo; and Yamaguchi, Akihiro, 4,540,818, Cl. 564-330.000.
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Miura, Mitsuyoshi, to Hirohiko Yasuda. Heat-generating device. 4,540,043, Cl. 165-104.120.
Miura, Yoshio: *See*—
Oku, Masuo; Yamashita, Masami; Miura, Yoshio; and Suzuki, Motoyuki, 4,541,084, Cl. 369-45.000.
Miyamoto, Kaoru, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Decapeptide having gonadotropin releasing activity. 4,540,513, Cl. 260-112.50R.
Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Fiber control apparatus in an open-end spinning frame. 4,539,808, Cl. 57-411.000.
Miyano, Toshiyuki; and Ohmura, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Bundling apparatus. 4,539,789, Cl. 53-131.000.
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Togari, Hisashi; and Miyata, Shinji, 4,540,953, Cl. 330-284.000.
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Inaba, Yukio; Igarashi, Taisei; Tahara, Susumu; and Miyatake, Takashi, 4,540,800, Cl. 549-462.000.
Mizumoto, Masakatsu, to Kabushiki Kaisha Komatsu Seisakusho. Three-dimensional work transfer apparatus. 4,540,087, Cl. 198-621.000.
Mizunoya, Nobuyuki; Kohama, Hajime; and Sugiura, Yasuyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Substrate for semiconductor modules and method of manufacture. 4,540,462, Cl. 156-630.000.
Mobil Oil Corporation: *See*—
Miale, Joseph N.; and Chang, Clarence D., 4,540,840, Cl. 585-640.000.
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Mobile Companies Inc.: *See*—
Habermehl, Robert, 4,539,761, Cl. 34-9.000.
Mochida, Ei: *See*—
Ohnishi, Haruo; Kosuzume, Hiroshi; Suzuki, Yasuo; and Mochida, Ei, 4,540,569, Cl. 424-94.000.
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Yau, David W. T.; and Modavis, Robert A., 4,540,251, Cl. 350-611.000.
Moeller, Knud A., to A.M.C. Maskin Compagni A/S. Grindstone dresser. 4,539,971, Cl. 125-11.00H.
Mogami, Satoshi, to Nippon Kogaku K.K. Wide angle zoom lens. 4,540,249, Cl. 350-426.000.
Molimar, Maurice, to Renault Vehicules Industriels. Driving system for exciting a mechanical component at its resonant frequency for fatigue-testing purposes. 4,539,845, Cl. 73-578.000.
Molitor, Victor D. Heat exchanger. 4,540,045, Cl. 165-164.000.
Molle, Roger: *See*—
Chauvin, Jacques; and Molle, Roger, 4,540,956, Cl. 331-116.00R.
Molloy, Edward W.; and Shafer, Ronald E., to General Motors Corporation. Selectively operable rotary drive means. 4,540,381, Cl. 464-29.000.
Molloy, Edward W.: *See*—
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Monaghan, Richard L.; and Kong, Yu-Lin, to Merck & Co., Inc. Choline oxidase inhibitor. 4,540,575, Cl. 424-115.000.
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Chupp, John P.; and Balthazor, Terry M., 4,540,522, Cl. 260-465.00E.
Runkle, Charles J., 4,540,109, Cl. 225-1.000.
Montedison S.p.A.: *See*—
Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, 4,540,711, Cl. 514-720.000.
Mooiman, Michael B.: *See*—
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Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., to Motorola, Inc. Shock absorber for quartz crystals. 4,540,908, Cl. 310-326.000.

Moore, David: *See*—
Peck, Alan M.; Reedman, David C.; Graveling, Frederick J.; Moore, David; and Mansfield, Graham J., 4,541,054, Cl. 364-474.000.

Moore, Derek W.: *See*—
Ibbetson, David N. I., 4,541,031, Cl. 361-67.000.

Moore, John W., to Swan Corporation, The. Free-standing shower. 4,539,721, Cl. 4-613.000.

Moore, Richard M., to Burroughs Corporation. Aerodynamically enhanced heat sink. 4,541,004, Cl. 357-81.000.

Moore, William P. Method of preserving fodders with a nutritive coating. 4,540,586, Cl. 426-69.000.

Moorman Manufacturing Company: *See*—
Stephan, Kurt F.; and Stephan, John T., 4,540,820, Cl. 564-38.000.

Moran, David P. J.; and Campbell, Iain J., to Lever Brothers Company. Reduced fat spread and a process for the production thereof. 4,540,593, Cl. 426-603.000.

Morawski, Lawrence V.: *See*—
Morawski, Longine V.; and Morawski, Lawrence V., 4,540,187, Cl. 279-1.00L.

Morawski, Longine V.; and Morawski, Lawrence V. Collet chuck for tapered workpieces. 4,540,187, Cl. 279-1.00L.

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Chuiko, Alexei A.; Morev, Anatoly V.; Golovkov, Alexandr S.; Smirnov, Valentin A.; Voronin, Evgeny F.; Evlakhova, Raisa A.; Guba, Galina Y.; Slushnene, Iolita R.; Pasvyanskas, Arunas V.; and Sushko, Roman V., 4,540,652, Cl. 430-84.000.

Mori, Yoshihisa: *See*—
Kakuhashi, Takeshi; Tahara, Hiroshi; and Mori, Yoshihisa, 4,540,463, Cl. 156-630.000.

Mori, Yoshikazu; and Kobayashi, Osamu, to Kabushiki Kaisha Nippon Coinco. Bill accepting device and method for controlling accepting of bills. 4,540,081, Cl. 194-4.00C.

Morimoto, Kiyoshi; and Watanabe, Hiroshi, to Futaba Denshi Kogyo K.K. Fluorescent display device. 4,540,983, Cl. 340-772.000.

Morimoto, Yoshiro: *See*—
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,539,869, Cl. 74-866.000.

Morino, Daizo: *See*—
Ueda, Ikuo; Morino, Daizo; and Takimoto, Koichi, 4,540,701, Cl. 514-357.000.

Morino, Seiji; and Kawai, Hisasi, to Nippon Soken, Inc. Electromagnetic driving device. 4,540,905, Cl. 310-12.000.

Morita, Akitaka; and Nittaya, Hiroshi, to Sharp Kabushiki Kaisha. Electronic target hunting game apparatus. 4,540,180, Cl. 273-313.000.

Moriuchi, Yasuhiro: *See*—
Saegusa, Takeo; Kobayashi, Shiro; and Moriuchi, Yasuhiro, 4,540,747, Cl. 525-410.000.

Morlock, Ruben D., to Haybuster Manufacturing, Inc. Drill frame construction. 4,539,921, Cl. 111-52.000.

Morris, Martin; and Fishler, Mark K., to Vesuvius Crucible Company. Carbon-containing refractories with superior erosion and oxidation resistance. 4,540,675, Cl. 501-99.000.

Morris, Richard A.: *See*—
Green, John F.; and Morris, Richard A., 4,540,165, Cl. 269-325.000.

Morse, Albert I.: *See*—
Simmonds, Robert C., Jr.; Gilbride, Andrew J.; and Morse, Albert I., 4,540,608, Cl. 427-282.000.

Morton Thiokol, Inc.: *See*—
Stevens, George L., 4,539,910, Cl. 202-349.000.
Waatti, Kurt J.; and Border, Daniel R., 4,540,715, Cl. 521-26.000.

Moser, Hermann, to Hoechst Aktiengesellschaft. Roll-fusing apparatus. 4,540,267, Cl. 355-3.0FU.

Moteki, Murato; Shimada, Yoshio; Tanaka, Fumihiro; Watanabe, Fumio; and Komatsu, Kazuyuki, to Kabushiki Kaisha Daini Seikosha. Thermal color transfer system. 4,540,992, Cl. 346-76.0PH.

Motorola, Inc.: *See*—
Ackerman, Charles B., 4,540,867, Cl. 219-121.0LW.
Day, Samuel W., Jr., 4,540,989, Cl. 343-900.000.
Eastmond, Bruce C.; and Richardson, Julian H., 4,541,118, Cl. 455-35.000.
Hunter, William L.; and Theobald, Paul R., 4,541,005, Cl. 357-81.000.
Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., 4,540,908, Cl. 310-326.000.
Pumo, Joseph; and Belleville, Marc J. E., 4,540,898, Cl. 307-269.000.

Moulton, Alexander E., to Alex Moulton Limited. Bicycle frame. 4,540,190, Cl. 280-278.000.

Moy, Timothy Y., to Ashland Oil, Inc. Vapor generator and its use in generating vapors in a pressurized gas. 4,540,531, Cl. 261-141.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See*—
Fitzer, Erich; Brennfleck, Karl; and Schlichting, Jurgen, deceased, 4,540,606, Cl. 427-247.000.

Mueller, Harald; and Schwerdt, Friedrich, to International Business Machines Corporation. Method of renewing defective copper conductors on the external planes of multilayer circuit boards. 4,540,464, Cl. 156-639.000.

Muhlbauer, Klemens: *See*—
Ermer, Wolfgang; and Muhlbauer, Klemens, 4,539,972, Cl. 125-16.00R.

Mukamal, Harold: *See*—
Ashlock, Lysander T.; Mukamal, Harold; and White, William H., 4,540,634, Cl. 428-451.000.

Muller, Alexander: *See*—
Boyd, John H., Jr.; and Muller, Alexander, 4,540,921, Cl. 318-254.000.

Muller, Claus D.: *See*—
Franke, Albrecht; Muller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Gunther; Muller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,540,697, Cl. 514-255.000.

Muller, Josef: *See*—
Franke, Albrecht; Muller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Gunther; Muller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,540,697, Cl. 514-255.000.

Mulvenna, Charles A. Energy transfer device. 4,540,344, Cl. 417-240.000.

Munk, Benedikt A.; and Larson, Clayton J., to United States of America, Navy. Broadband multi-element antenna. 4,540,988, Cl. 343-728.000.

Murai, Mikio: *See*—
Suzuki, Takashi; Hibino, Kunio; Murai, Mikio; Kawase, Shigeki; and Shinohara, Koichi, 4,540,618, Cl. 428-141.000.

Murakami, Tsudoi: *See*—
Kada, Hironosuke; Sekino, Teruyoshi; Murayama, Hirogazu; Tatsumi, Iazuaki; and Murakami, Tsudoi, 4,541,062, Cl. 364-513.000.

Murakoshi, Makoto: *See*—
Konishi, Masahiro; and Murakoshi, Makoto, 4,541,021, Cl. 360-35.100.

Muramatsu, Keizi: *See*—
Takahashi, Kunio; Oda, Noriyuki; Kido, Nobuyuki; and Muramatsu, Keizi, 4,540,184, Cl. 277-12.000.

Muramatsu, Michihisa: *See*—
Ishizumi, Kikuo; Ohashi, Naohito; and Muramatsu, Michihisa, 4,540,695, Cl. 514-239.000.

Murayama, Hirogazu: *See*—
Kada, Hironosuke; Sekino, Teruyoshi; Murayama, Hirogazu; Tatsumi, Iazuaki; and Murakami, Tsudoi, 4,541,062, Cl. 364-513.000.

Murdock, Keith C.; and Durr, Frederick E., to American Cyanamid Company. 1,4-Bis(substituted-amino)-5,8-dihydroxyanthraquinones and leuco bases thereof. 4,540,519, Cl. 260-380.000.

Murdock, Keith C.; and Durr, Frederick E., to American Cyanamid Company. Method of treating tumors in warm-blooded animals. 4,540,583, Cl. 514-656.000.

Murdock, Keith C., to American Cyanamid Company. Schiff bases of [(aminoalkyl or substituted aminoalkyl)amino]-9,10-anthracenediones. 4,540,788, Cl. 546-264.000.

Muroi, Masayuki: *See*—
Tanida, Seiichi; Muroi, Masayuki; and Hasegawa, Toru, 4,540,517, Cl. 260-239.30B.

Murphy, Kent D. Coin carrier with plural slidable pockets. 4,540,008, Cl. 133-5.00A.

Murray, Gary P., to Robinair Division. Two stage vacuum pump with shaft seal. 4,540,353, Cl. 418-13.000.

Musin, Rafail M.; Gryaznov, Mikhail I.; Timofeev, Dmitry A.; Filatov, Nikolai Y.; and Andreeva, Tamara S. Pulse characteristic meter. 4,541,070, Cl. 364-900.000.

Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Penicillin derivative. 4,540,689, Cl. 514-196.000.

Myer, William J.; and Lamppa, Reid G., to Kraft, Inc. Multiple screw pasta manufacturing process. 4,540,592, Cl. 426-557.000.

Myers, Carl J.; and Ratzel, Richard O., to Warner & Swasey Company, The. Machine tool. 4,539,876, Cl. 82-32.000.

Myers, John H.: *See*—
Hattori, Kiyoshi; and Myers, John H., 4,540,416, Cl. 604-410.000.

Myojo Foods Co., Ltd.: *See*—
Harada, Haruo; Fujiwara, Akira; Hatanaka, Yoshio; and Iimura, Hironori, 4,540,590, Cl. 426-324.000.

Naan Mechanical Works: *See*—
Gorney, Moshe; Lerner, Michael; and Shavit, Amos, 4,540,125, Cl. 239-232.000.

Nacom Industries, Inc.: *See*—
Southworth, Peter R.; and Baxter, Gregory R., 4,540,326, Cl. 414-217.000.

Nagasaki, Shoji; Kojima, Keiichi; and Ueno, Keiji, to Sumitomo Electric Industries, Ltd. Process for producing optical fiber for optical transmission. 4,540,597, Cl. 427-44.000.

Nagashima, Shigeo; Torii, Shunichi; Omoda, Koichiro; and Inagami, Yasuhiro, to Hitachi, Ltd. Data processing system including scalar data processor and vector data processor. 4,541,046, Cl. 364-200.000.

Nagata, Kiyoshi. Stereoscopic color television system. 4,541,007, Cl. 358-3.000.

Nagayama, Hajime: *See*—
Hagiwara, Hiroshi; Shirasaka, Masaru; and Nagayama, Hajime, 4,540,553, Cl. 423-230.000.

Nagel, Dietmar: *See*—
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Nagel, Kennedy, Arad & Associates: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham, 4,540,380, Cl. 446-463.000.

Nagy, Laszlo : *See*—
Kiszel, Janos; Papp, Laszlo ; and Nagy, Laszlo , 4,539,984, Cl. 128-204.230.

Nair, Xina; and Temple, Davis L., Jr., to Bristol-Myers Company. Topical nonsteroidal anti-inflammatory compositions and uses. 4,540,581, Cl. 514-415.000.
Naito, Ryuichi: *See—*
Takaoka, Saburo; Naito, Ryuichi; Yokogawa, Fumihiko; and Ogawa, Youichi, 4,540,897, Cl. 307-268.000.
Nakagami, Akihiro: *See—*
Kasugai, Joji; and Nakagami, Akihiro, 4,540,103, Cl. 220-203.000.
Nakagawa, Kazuyuki: *See—*
Uchida, Minoru; Nishi, Takao; and Nakagawa, Kazuyuki, 4,540,703, Cl. 514-381.000.
Nakahara, Yutaka; and Kimura, Ryoji, to Adeka Argus Chemical Co., Ltd. Diallyl-1,3,5-triazino-4-(2,2,6,6-tetramethyl piperidyl) amines as monomers and polymers and stabilized synthetic resin compositions. 4,540,728, Cl. 524-100.000.
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, to Minolta Camera. Camera accessory with data producer. 4,540,262, Cl. 354-195.130.
Nakai, Nobuo: *See—*
Fujii, Teruo; Fukushima, Hiroshi; and Nakai, Nobuo, 4,540,856, Cl. 179-89.000.
Nakajima, Toyohei; and Tomono, Kiyohisa, to Honda Giken Kogyo K.K. Duty ratio control method for solenoid control valve means. 4,539,967, Cl. 123-585.000.
Nakajima, Yasuyuki: *See—*
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; Hatanaka, Masataka; Hirose, Masayoshi; and Kudo, Masaki, 4,540,706, Cl. 514-403.000.
Nakamura, Hiroshi: *See—*
Nonaka, Toshio; Nakamura, Hiroshi; and Yamagishi, Choho, 4,540,446, Cl. 148-1.500.
Nakamura, Kousuke: *See—*
Takeda, Yukio; Ogihara, Satoru; Ura, Mitsuru; Nakamura, Kousuke; Asai, Tadamichi; Ohkoshi, Tokio; Matsushita, Yasuo; and Maeda, Kunihiro, 4,540,673, Cl. 501-96.000.
Nakamura, Kyoichi: *See—*
Senda, Kenichi; Ando, Masao; Nakamura, Kyoichi; and Nishida, Tatehiko, 4,540,718, Cl. 521-58.000.
Nakamura, Minoru; and Kasai, Minoru, to Hitec Co., Ltd. Apparatus for manufacturing sausages or the like. 4,539,796, Cl. 53-576.000.
Nakano, Masaki: *See—*
Shinkai, Kouki; Hagiwara, Naoki; and Nakano, Masaki, 4,540,915, Cl. 313-486.000.
Nakano, Motoo, to Fujitsu Limited. Semiconductor device for memory cell. 4,541,074, Cl. 365-178.000.
Nakano, Yoshiyuki, to Nippon Kogaku K.K. Shutter mechanism of a camera. 4,540,260, Cl. 354-173.100.
Nakashima, Seiichiro; Inaba, Hajimu; and Inagaki, Shigemi, to Fanuc Ltd. Swivel device. 4,540,332, Cl. 414-744.00R.
Nakashima, Tuneyasu: *See—*
Komazawa, Hiroyasu; Hotta, Hiroshi; Nakatsuji, Hiroshi; Yoko, Kiyoshi; Higashiyama, Seiichi; Nakashima, Tuneyasu; and Gotoh, Noboru, 4,540,773, Cl. 528-480.000.
Nakatani, Masayuki: *See—*
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,539,903, Cl. 99-470.000.
Nakatsuji, Hiroshi: *See—*
Komazawa, Hiroyasu; Hotta, Hiroshi; Nakatsuji, Hiroshi; Yoko, Kiyoshi; Higashiyama, Seiichi; Nakashima, Tuneyasu; and Gotoh, Noboru, 4,540,773, Cl. 528-480.000.
Namba, Satoshi: *See—*
Irie, Yoichiro; Shigemura, Yutaka; and Namba, Satoshi, 4,540,279, Cl. 355-69.000.
Namikawa, Syunji: *See—*
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Napp Systems (USA) Inc.: *See—*
Sakurai, Kiyomi, 4,540,649, Cl. 430-270.000.
Narita, Ko: *See—*
Haraguchi, Hiroshi; Narita, Ko; and Iwata, Toshiharu, 4,539,957, Cl. 123-425.000.
Nath, Dilip K., to Aetna Telecommunications Laboratories. Aluminum oxide optical fiber coating. 4,540,601, Cl. 427-163.000.
Nath, Gunther; Kreitmair, Albert; and Jaeger, Vincent. Apparatus for coagulation by heat radiation. 4,539,987, Cl. 128-303.100.
National Distillers and Chemical Corporation: *See—*
Garst, Roger H.; Tuller, Frank N.; and Tucker, Charles R., 4,540,521, Cl. 260-459.00A.
McCaffrey, Eugene F.; Dieterman, Alfred J.; and Knazko, Luba, 4,540,511, Cl. 252-321.000.
Speca, Anthony N., 4,540,680, Cl. 502-119.000.
National Electrostatics Corporation: *See—*
Sundquist, Mark L., 4,539,822, Cl. 62-55.500.
National Petro Chemicals Corporation: *See—*
Mayhew, Harry W.; French, Richard J.; and Rekers, Louis J., 4,540,755, Cl. 526-100.000.
National Research Development Corporation: *See—*
Klinner, Wilfred E., 4,539,798, Cl. 56-16.400.
Sainz, Antonio J.; and Roberts, Victor C., 4,540,946, Cl. 328-167.000.
National Semiconductor Corporation: *See—*
Rapp, A. Karl, 4,541,077, Cl. 365-210.000.
National Starch and Chemical Corporation: *See—*
Tessler, Martin M.; Dirscherl, Teresa A.; and Wurzburg, Otto B., 4,540,778, Cl. 536-114.000.
Naumann, Johannes: *See—*
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Nawata, Kazuyoshi: *See—*
Yokoshima, Minoru; Nawata, Kazuyoshi; Ohkubo, Tetsuo; and Hattori, Hideaki, 4,540,809, Cl. 560-185.000.
Naya, Eizo: *See—*
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NEC Corporation: *See—*
Hirosaki, Botaro, 4,541,104, Cl. 375-114.000.
Ohmori, Kenji, 4,541,071, Cl. 364-900.000.
Ryu, Toshihiko, 4,540,948, Cl. 329-122.000.
Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek: *See—*
Wesseling, Karel H.; and de Wit, Benjamino, 4,539,997, Cl. 128-667.000.
Negishi, Akira: *See—*
Kawai, Toshikazu; Negishi, Akira; Ojima, Iwao; and Fuchikami, Takamasa, 4,540,835, Cl. 568-842.000.
Nehring, Robert J., Jr.: *See—*
Sands, Bruce W.; and Nehring, Robert J., Jr., 4,540,629, Cl. 428-402.000.
Neill, David C. Jack bolt assembly. 4,540,199, Cl. 285-27.000.
Neisius, Karl H.: *See—*
Klug, Rudolf; Hartner, Hartmut; Merrem, Hans-Joachim; and Neisius, Karl H., 4,540,650, Cl. 430-281.000.
Nelson, Donald A. Game ball return balancer. 4,540,181, Cl. 273-352.000.
Nelson, Edwin A.; and Webb, Ronald C., to Advanced Design Corporation. Dental cleansing system. 4,540,365, Cl. 433-88.000.
Nelson Research & Development Co.: *See—*
Horn, Alan S., 4,540,691, Cl. 514-211.000.
Nelson, Roy A., to LTV Aerospace and Defense Co. Biaxial scissors fold, post tensioned structure. 4,539,786, Cl. 52-645.000.
Neuhierl GmbH & Co. KG: *See—*
Neuhierl, Hermann, 4,540,119, Cl. 238-10.00R.
Neuhierl, Hermann, to Neuhierl GmbH & Co. KG. Flexible track segment. 4,540,119, Cl. 238-10.00R.
Neurath, Alexander R.; and Horowitz, Bernard, to New York Blood Center, Inc. Undenatured virus-free biologically active protein derivatives. 4,540,573, Cl. 424-85.000.
Nevid, Jeffrey S.: *See—*
Rubenstein, Charles P.; Nevid, Jeffrey S.; and Rathus, Spencer A., 4,540,292, Cl. 368-29.000.
New York Blood Center, Inc.: *See—*
Neurath, Alexander R.; and Horowitz, Bernard, 4,540,573, Cl. 424-85.000.
Newton, William P.: *See—*
Yonovich, John R.; Newton, William P.; and Dense, Brian S., 4,540,070, Cl. 188-380.000.
Neyens, Edward J.; and Vaal, John G., to International Telephone and Telegraph Corporation. Zero if frequency-modulator. 4,540,958, Cl. 332-16.00R.
NGK Insulators, Ltd.: *See—*
Kato, Kazuaki; and Washizu, Tomio, 4,540,968, Cl. 337-31.000.
NGK Spark Plug Co., Ltd.: *See—*
Kondo, Kazuo; and Okuyama, Masahiko, 4,540,671, Cl. 501-9.000.
Nguyen, Duyet H.: *See—*
Ballegeer, Jean C.; and Nguyen, Duyet H., 4,541,043, Cl. 364-200.000.
Nichols, Gary A., to General Motors Corporation. Fuel injection system. 4,539,962, Cl. 123-470.000.
Nichols, James D.: *See—*
Fishman, Max; and Nichols, James D., 4,541,008, Cl. 358-13.000.
Nicholson, Myron D.; and Beckman, John H., to Union Carbide Corporation. Tar-depleted, concentrated, liquid smoke compositions. 4,540,613, Cl. 428-36.000.
Nickel, Horst: *See—*
Henk, Hermann; Kramer, Erich; Schundehutte, Karl H.; and Nickel, Horst, 4,540,776, Cl. 534-635.000.
Nickell, Louis G.; Stach, Leonard J.; and Luteri, George F., to Velsicol Chemical Corporation. 3-Chlorobenzyl-3,6-dichloro-2-methoxybenzoate as a grape ripener. 4,540,431, Cl. 71-107.000.
Nicod, Roger: *See—*
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Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,540,689, Cl. 514-196.000.
Niles Chemical Paint Co.: *See—*
Gilvary, John P.; and Lawton, John V., 4,540,731, Cl. 524-269.000.
Nilsson, Claes T.: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,540,544, Cl. 264-532.000.
Nimmagadda, Rao R., to Smith International, Inc. Method of producing thin, hard coating. 4,540,596, Cl. 427-37.000.
Nippon Air Brake Co., Ltd.: *See—*
Suzuki, Shoji; and Ishiwata, Ichiro, 4,540,072, Cl. 192-4.00A.
Nippon Electric Company Ltd.: *See—*
Kimura, Katsuji, 4,541,122, Cl. 455-236.000.
Togari, Hisashi; and Miyata, Shinji, 4,540,953, Cl. 330-284.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Aoki, Eiichiro, 4,539,884, Cl. 84-1.240.
Chihana, Masanobu, 4,539,883, Cl. 84-1.220.
Oshima, Yutaka, 4,540,440, Cl. 106-148.000.
Nippon Hoso Kyokai: *See*—
Maruyama, Masanori; Fukushima, Masakazu; Kato, Shinichi; and Ogusu, Chihaya, 4,540,916, Cl. 315-16.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
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Nippon Kogaku K.K.: *See*—
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Mogami, Satoshi, 4,540,249, Cl. 350-426.000.
Nakano, Yoshiyuki, 4,540,260, Cl. 354-173.100.
Okubo, Yuji, 4,540,266, Cl. 354-458.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Kawai, Koichi; and Mikuriya, Minoru, 4,540,104, Cl. 220-224.000.
Nippon Light Metal Company Limited: *See*—
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; Kajiyama, Takashi; and Hotta, Kunihiko, 4,540,449, Cl. 148-31.500.
Nippon Notion Kogyo Co., Ltd.: *See*—
Kasai, Kazumi, 4,539,735, Cl. 24-621.000.
Nippon Soken, Inc.: *See*—
Morino, Seiji; and Kawai, Hisasi, 4,540,905, Cl. 310-12.000.
Tomita, Masahiro; and Takagi, Shigeru, 4,540,535, Cl. 264-44.000.
Nippon Steel Corporation: *See*—
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Nippon Suisan Kabushiki Kaisha: *See*—
Rachi, Kazuo; Kubota, Shouichi; and Sasaki, Isamu, 4,540,589, Cl. 426-250.000.
Nippondenso Co., Ltd.: *See*—
Haraguchi, Hiroshi; Narita, Ko; and Iwata, Toshiharu, 4,539,957, Cl. 123-425.000.
Hayashi, Mikio; Kawasumi, Kouzi; and Kimura, Yoshinobu, 4,540,252, Cl. 350-634.000.
Honda, Masakazu; Harada, Susumu; and Kobayashi, Akio, 4,541,050, Cl. 364-424.000.
Kondo, Ryoji; Takamura, Kozo; and Higuchi, Kanji, 4,540,910, Cl. 313-11.500.
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, 4,539,823, Cl. 62-228.500.
Sawada, Toshiichi; Fukami, Yasuhiko; and Kinkori, Shuzo, 4,539,947, Cl. 123-52.00M.
Nishi, Kazuro; Kurahashi, Koichiro; Hashimoto, Tsutomu; Senoo, Toshihiko; and Yamato, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Hologram scanner. 4,540,247, Cl. 350-3.710.
Nishi, Takao: *See*—
Uchida, Minoru; Nishi, Takao; and Nakagawa, Kazuyuki, 4,540,703, Cl. 514-381.000.
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, to Nippondenso Co., Ltd. Refrigeration system. 4,539,823, Cl. 62-228.500.
Nishida, Masami; Nishimura, Keizo; Arai, Takao; and Amada, Nobutaka, to Hitachi, Ltd. Code error detection and correction method and apparatus. 4,541,091, Cl. 371-39.000.
Nishida, Tatehiko: *See*—
Senda, Kenichi; Ando, Masao; Nakamura, Kyoichi; and Nishida, Tatehiko, 4,540,718, Cl. 521-58.000.
Nishijima, Toyoki; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Method of improving the light resistance of a dye image. 4,540,653, Cl. 430-372.000.
Nishikawa, Masumi, to Aisin Seiki Kabushiki Kaisha. Regulating apparatus for a steering shaft. 4,539,861, Cl. 74-493.000.
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Hoshika, Shuji; Ishiai, Hideyuki; Nishikawa, Yukiyasu; Hara, Masato; Aiura, Hirochika; Okamoto, Ikuzo; and Shindow, Osamu, 4,540,253, Cl. 351-211.000.
Nishimura, Keizo: *See*—
Nishida, Masami; Nishimura, Keizo; Arai, Takao; and Amada, Nobutaka, 4,541,091, Cl. 371-39.000.
Nishio, Shigeru: *See*—
Gomi, Koichi; and Nishio, Shigeru, 4,540,153, Cl. 251-11.000.
Nishiyama, Haruo, to Sharp Kabushiki Kaisha. Opening detecting device of a copy document cover suitable for electrophotographic copying machine. 4,540,269, Cl. 355-3.00R.
Nishizawa, Jun-ichi, to Semiconductor Research Foundation. Method of fabricating semiconductor device by dry process utilizing photochemical reaction, and apparatus therefor. 4,540,466, Cl. 156-643.000.
Nishizima, Toyoki; Sasaki, Masao; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Color photographic light-sensitive material. 4,540,656, Cl. 430-505.000.
Nissan, Alfred H.: *See*—
Klein, Edward P.; and Nissan, Alfred H., 4,539,827, Cl. 68-3.0SS.
Nissan Chemical Industries Ltd.: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; Hatanaka, Masataka; Hirose, Masayoshi; and Kudo, Masaki, 4,540,706, Cl. 514-403.000.
Nissan Motor Co., Ltd.: *See*—
Fujimura, Ryuta, 4,540,064, Cl. 181-227.000.
Hara, Seinosuke; Miisho, Kazuyuki; Matsumoto, Yasuo; and Yoshikawa, Yasuo, 4,539,951, Cl. 123-90.170.
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, 4,540,059, Cl. 180-141.000.
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,539,869, Cl. 74-866.000.
Sugano, Kazuhiko, 4,539,870, Cl. 74-869.000.
Takahashi, Kotei, 4,539,858, Cl. 74-475.000.
Yoneda, Kenji; and Sugihara, Kunihiko, 4,540,126, Cl. 239-533.400.
Nissei Plastics Industrial Co., Ltd.: *See*—
Yamazaki, Yoshihiko, 4,540,359, Cl. 425-135.000.
Nittaya, Hiroshi: *See*—
Morita, Akitaka; and Nittaya, Hiroshi, 4,540,180, Cl. 273-313.000.
Nittetsu Steel Drum Co., Ltd.: *See*—
Inoue, Makoto; Irie, Hirofumi; Kobayashi, Youichi; and Kubota, Tetuo, 4,540,323, Cl. 413-6.000.
Nitto Boseki Co. Ltd.: *See*—
Harada, Susumu; Shimizu, Kiyoshi; and Serizawa, Hajime, 4,540,760, Cl. 526-211.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Kakuhashi, Takeshi; Tahara, Hiroshi; and Mori, Yoshihisa, 4,540,463, Cl. 156-630.000.
Nixdorf Computer AG: *See*—
Knoop, Franz-Josef, 4,540,858, Cl. 200-5.00R.
NL Industries, Inc.: *See*—
Granger, Stanley W.; and Camerano, James J., 4,540,046, Cl. 166-55.000.
Noda, Azusa; Fujitaka, Nobuo; and Fujisaki, Masaru, to Honda Giken Kogyo Kabushiki Kaisha. Rear motorcycle fork. 4,540,193, Cl. 280-284.000.
Noe, Andreas: *See*—
Noe, Oskar; Noe, Andreas; and Noe, Rolf, 4,539,830, Cl. 72-12.000.
Noe, Oskar; Noe, Andreas; and Noe, Rolf, to BWG Bergwerk-und Walzwerk-Maschinenbau GmbH. System for making thin metal strip. 4,539,830, Cl. 72-12.000.
Noe, Rolf: *See*—
Noe, Oskar; Noe, Andreas; and Noe, Rolf, 4,539,830, Cl. 72-12.000.
Noguchi, Kiyoshi: *See*—
Kobayashi, Koji; Noguchi, Kiyoshi; and Takayama, Suguru, 4,540,600, Cl. 427-130.000.
Nohren, Hubert: *See*—
Werkes, Heinz; and Nohren, Hubert, 4,540,987, Cl. 343-18.00B.
Nolan, David C. Circuit tester for automotive electrical systems. 4,540,940, Cl. 324-133.000.
Nolan, James M., Jr.: *See*—
Stiffler, Jack J.; Budwey, Michael J.; and Nolan, James M., Jr., 4,541,094, Cl. 371-68.000.
Nomori, Hiroyuki: *See*—
Fujimaki, Yoshihide; Takei, Yoshiaki; and Nomori, Hiroyuki, 4,540,651, Cl. 430-72.000.
Nonaka, Toshio; Nakamura, Hiroshi; and Yamagishi, Choho, to OKI Electric Industry Co., Ltd. Method of forming ohmic contact on GaAs by Ge film and implanting impurity ions therethrough. 4,540,446, Cl. 148-1.500.
Noranda, Inc.: *See*—
O'Hanlon, Thomas A., 4,540,056, Cl. 175-393.000.
Nordstrom, Arnold B., to Ancra Corporation. End stop for cargo loading system. 4,540,080, Cl. 193-40.000.
Norrie, Lyle W.; and Pawlicki, Richard I., to Knud Simonsen Industries Ltd. Product hanger. 4,540,094, Cl. 211-113.000.
Norris, Philip R.; and Wareham, Richard R., to Polaroid Corporation. Card motion picture method. 4,540,255, Cl. 352-44.000.
Norris, Philip R.; and Wareham, Richard R., to Polaroid Corporation. Motion picture film card. 4,540,256, Cl. 352-239.000.
Northeastern University: *See*—
Giessen, Bill C., 4,540,546, Cl. 420-590.000.
Norwich Eaton Pharmaceuticals, Inc.: *See*—
Alaimo, Robert J., 4,540,693, Cl. 514-249.000.
Nouno, Yasushi; Konishi, Masami; and Sasaki, Yoshio, to Toyota Jidosha Kabushiki Kaisha. Supporting mechanism for a valve system of an internal-combustion engine. 4,539,952, Cl. 123-90.360.
Nouvelle Lemania S.A.: *See*—
Dubois, Jean-Daniel, 4,540,291, Cl. 368-28.000.
Nozaki, Tadashi: *See*—
Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, 4,539,859, Cl. 74-475.000.
Nukina, Yasuyuki; Namikawa, Syunji; Tomioka, Toshikazu; Yamamoto, Takehiko; and Oi, Susumu, to Matsushita Electric Industrial Company, Limited. Methane fermentation. 4,540,666, Cl. 435-167.000.
Nysted, Leonard N.; and Pappo, Raphael, to G. D. Searle & Co. 5 Fluoro PGI compounds. 4,540,801, Cl. 549-465.000.
Nystrom, Wilford O.; Riedel, Kenneth E.; and Doerschner, David L., to Hollister Incorporated. External male catheter and applicator. 4,540,409, Cl. 604-349.000.
Oberdeck, Martin K.; and Koza, John R., to Koza, John R. Hydrophilic sheet and method of making. 4,540,628, Cl. 428-336.000.
OCG Technology Inc.: *See*—
Doherty, Richard F.; and Pierry, Anthony, 4,540,000, Cl. 128-696.000.
Ochi, Akira; and Asada, Toshihiko, to Park Trading Co., Ltd. Sound wave attenuation device. 4,540,063, Cl. 181-135.000.
Ochi, Shigeyuki; and Yamanaka, Seisuke, to Sony Corporation. Solid state image pickup device. 4,541,016, Cl. 358-228.000.
Oda, Noriyuki: *See*—
Takahashi, Kunio; Oda, Noriyuki; Kido, Nobuyuki; and Muramatsu, Keizi, 4,540,184, Cl. 277-12.000.
Odaka, Kentaro: *See*—
Sako, Yoichiro; and Odaka, Kentaro, 4,541,092, Cl. 371-39.000.
Odashima, Takeshi; and Saito, Tsutomu, to Kabushiki Kaisha Saginomiya Seisakusho. Pressure responsive switch. 4,540,860, Cl. 200-83.00C.

Odell, Jack L., II: *See*—
Mayer, Robert A.; Reith, Michael W.; and Odell, Jack L., II, 4,541,011, Cl. 358-106.000.
Odorisio, Paul: *See*—
Spivack, John D.; Pastor, Stephen D.; and Odorisio, Paul, 4,540,732, Cl. 524-289.000.
Office National d'Etudes et de Recherches Aerospatiales: *See*—
Chevallier, Sammy, 4,540,770, Cl. 528-248.000.
Officine Savio S.p.A.: *See*—
Bertoli, Luciano; Badioli, Roberto; and Speranzin, Claudio, 4,539,802, Cl. 57-22.000.
Ferro, Francesco; and Franci, Giosue , 4,539,803, Cl. 57-263.000.
Oftalysine S.r.l.: *See*—
Carracoy, Claudio, 4,540,007, Cl. 132-88.500.
Ogawa, Youichi: *See*—
Takaoka, Saburo; Naito, Ryuichi; Yokogawa, Fumihiko; and Ogawa, Youichi, 4,540,897, Cl. 307-268.000.
Ogawa, Yuichiro: *See*—
Ishii, Ryutaro; and Ogawa, Yuichiro, 4,540,131, Cl. 242-55.000.
Ogihara, Satoru: *See*—
Takeda, Yukio; Ogihara, Satoru; Ura, Mitsuru; Nakamura, Kousuke; Asai, Tadamichi; Ohkoshi, Tokio; Matsushita, Yasuo; and Maeda, Kunihiro, 4,540,673, Cl. 501-96.000.
Ogura, Masahiro: *See*—
Hasegawa, Junzo; Ogura, Masahiro; Kanema, Hiroshi; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,540,665, Cl. 435-146.000.
Ogura, Mitsuru, to Sharp Kabushiki Kaisha. Hand-held printer. 4,539,906, Cl. 101-93.140.
Ogusu, Chihaya: *See*—
Maruyama, Masanori; Fukushima, Masakazu; Kato, Shinichi; and Ogusu, Chihaya, 4,540,916, Cl. 315-16.000.
O'Hanlon, Thomas A., to Inco Limited; Falconbridge Limited; Noranda, Inc.; Kidd Creek Mines Limited; and Flow Industries, Inc. Cutter assembly. 4,540,056, Cl. 175-393.000.
Ohashi, Naohito: *See*—
Ishizumi, Kikuo; Ohashi, Naohito; and Muramatsu, Michihisa, 4,540,695, Cl. 514-239.000.
Ohgoh, Toshiharu: *See*—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,540,704, Cl. 514-389.000.
Ohkoshi, Tokio: *See*—
Takeda, Yukio; Ogihara, Satoru; Ura, Mitsuru; Nakamura, Kousuke; Asai, Tadamichi; Ohkoshi, Tokio; Matsushita, Yasuo; and Maeda, Kunihiro, 4,540,673, Cl. 501-96.000.
Ohkubo, Tetsuo: *See*—
Yokoshima, Minoru; Nawata, Kazuyoshi; Ohkubo, Tetsuo; and Hattori, Hideaki, 4,540,809, Cl. 560-185.000.
Ohmori, Kenji, to NEC Corporation. Dynamic gate array whereby an assembly of gates is simulated by logic operations on variables selected according to the gates. 4,541,071, Cl. 364-900.000.
Ohmura, Hideo: *See*—
Miyano, Toshiyuki; and Ohmura, Hideo, 4,539,789, Cl. 53-131.000.
Ohmuro, Yuzo: *See*—
Kambara, Jun; Ohmuro, Yuzo; and Kamogawa, Nin-ichi, 4,540,646, Cl. 430-122.000.
Ohnishi, Haruo; Kosuzame, Hiroshi; Suzuki, Yasuo; and Mochida, Ei, to Mochida Seiyaku Kabushiki Kaisha. Method for treatment of allergic disorders and immune complex diseases. 4,540,569, Cl. 424-94.000.
Ohnishi, Shinji: *See*—
Otsuka, Kanji; Mitsusada, Kazumichi; Sekibata, Masao; and Ohnishi, Shinji, 4,541,003, Cl. 357-74.000.
Ohta, Hiroshi, to Rikagaku Kenkyusho. Josephson junction element and method of making the same. 4,539,741, Cl. 29-569.00R.
Ohtsuka, Issei: *See*—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,540,704, Cl. 514-389.000.
Ohyama, Akira, to Tsubakimoto Chain Co. Over-load and light-load protection for electric machinery. 4,541,029, Cl. 361-31.000.
Ohyama, Kazuo: *See*—
Yamamoto, Kuniyuki; and Ohyama, Kazuo, 4,540,077, Cl. 192-70.120.
Oi, Susumu: *See*—
Nukina, Yasuyuki; Namikawa, Syunji; Tomioka, Toshikazu; Yamamoto, Takehiko; and Oi, Susumu, 4,540,666, Cl. 435-167.000.
Oinoue, Kenichi: *See*—
Hayashi, Asao; Aoki, Masahiro; Oinoue, Kenichi; and Ida, Masatoshi, 4,540,881, Cl. 250-201.000.
Ojima, Iwao: *See*—
Kawai, Toshikazu; Negishi, Akira; Ojima, Iwao; and Fuchikami, Takamasa, 4,540,835, Cl. 568-842.000.
Oka, Yasuo: *See*—
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; Kajiyama, Takashi; and Hotta, Kunihiko, 4,540,449, Cl. 148-31.500.
Okabe, Nobuo: *See*—
Daitoku, Koichi; and Okabe, Nobuo, 4,540,264, Cl. 354-400.000.
Okabe, Shotaro: *See*—
Fujiyama, Yasutomo; and Okabe, Shotaro, 4,539,934, Cl. 118-723.000.
Okamoto, Ikuzo: *See*—
Hoshika, Shuji; Ishiai, Hideyuki; Nishikawa, Yukiyasu; Hara, Masato; Aiura, Hirochika; Okamoto, Ikuzo; and Shindow, Osamu, 4,540,253, Cl. 351-211.000.
Okamoto, Yoshihisa, to B. F. Goodrich Company, The. Graft copolymers and process for their preparation. 4,540,742, Cl. 525-61.000.
O'Keeffe, William F.; and Garcia, Sonny Q., to O'Keeffe's, Inc. Barrell vault skylight system. 4,539,783, Cl. 52-200.000.
O'Keeffe's, Inc.: *See*—
O'Keeffe, William F.; and Garcia, Sonny Q., 4,539,783, Cl. 52-200.000.
OKI Electric Industry Co., Ltd.: *See*—
Nonaka, Toshio; Nakamura, Hiroshi; and Yamagishi, Choho, 4,540,446, Cl. 148-1.500.
Oku, Masuo; Yamashita, Masami; Miura, Yoshio; and Suzuki, Motoyuki, to Hitachi, Ltd. Focus servo system having object lens protection circuit for an optical disc player. 4,541,084, Cl. 369-45.000.
Okubo, Yuji, to Nippon Kogaku K.K. Camera in which exposure is electrically and mechanically controllable. 4,540,266, Cl. 354-458.000.
Okuda, Takao, to Sanyo Electric Co., Ltd. Induction heating apparatus. 4,540,866, Cl. 219-10.770.
Okumura, Mitsuhiro; Naya, Eizo; Yorita, Mitsumasa; and Takeya, Yasushi, to Mitsubishi Denki Kabushiki Kaisha. Contact material for vacuum circuit interrupter. 4,540,861, Cl. 200-144.00B.
Okunishi, Mizuho; and Yasunaga, Makoto, to Citizen Watch Co., Ltd. Method for controlling the temperature of the printing head of an impact printer. 4,540,295, Cl. 400-120.000.
Okuyama, Masahiko: *See*—
Kondo, Kazuo; and Okuyama, Masahiko, 4,540,671, Cl. 501-9.000.
Olin Corporation: *See*—
Lin, Lifun, 4,540,477, Cl. 204-242.000.
Oliver, Stewart W., to International Teldata II Corp. Meter interface unit for utility meter reading system. 4,540,849, Cl. 179-2.0AM.
Olsen, Sten O., to A/S Kongsberg Vapenfabrikk. Ram air turbines. 4,540,337, Cl. 415-141.000.
Olson, Donald C., to Shell Oil Company. Removal of H_2S from gaseous streams. 4,540,561, Cl. 423-573.00R.
Olson, Kurt G.; Das, Suryya K.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Cross-linked polymeric microgel prepared from polymerizing epoxy-containing monomer in the presence of an acid. 4,540,740, Cl. 524-811.000.
Olson, Raymond G., to Baxter Travenol Laboratories, Inc. Pressure pump having jaws and end-slots. 4,540,351, Cl. 417-476.000.
Olympus Optical Co., Ltd.: *See*—
Hayashi, Asao; Aoki, Masahiro; Oinoue, Kenichi; and Ida, Masatoshi, 4,540,881, Cl. 250-201.000.
Kimura, Kenji, 4,541,020, Cl. 360-22.000.
Manabe, Sugio, 4,540,549, Cl. 422-64.000.
Togino, Takayoshi, 4,540,248, Cl. 350-414.000.
Omoda, Koichiro: *See*—
Nagashima, Shigeo; Torii, Shunichi; Omoda, Koichiro; and Inagami, Yasuhiro, 4,541,046, Cl. 364-200.000.
Omori Machine: *See*—
Omori, Shozo, 4,540,614, Cl. 428-57.000.
Omori, Shozo, to Tokyo Shibaura Denki Kabushiki Kaisha; and Omori Machine. Bundle of paper sheets or the like. 4,540,614, Cl. 428-57.000.
Omori, Takuro: *See*—
Kanou, Ikuo; Yanagiuchi, Shigenobu; and Omori, Takuro, 4,541,069, Cl. 364-900.000.
Omron Tateisi Electronics Co.: *See*—
Hagiwara, Isamu, 4,541,057, Cl. 364-408.000.
Omura, Takashi: *See*—
Otake, Katsumasa; Omura, Takashi; Kayane, Yutaka; and Imada, Kunihiko, 4,540,418, Cl. 8-524.000.
Oneto, Francis E. J.; and Vermersch, Marc, to Lever Brothers Company. Cosmetic composition. 4,540,567, Cl. 424-45.000.
Onoda Cement Co., Inc.: *See*—
Hagiwara, Hiroshi; Shirasaka, Masaru; and Nagayama, Hajime, 4,540,553, Cl. 423-230.000.
Onoda, Shigeyoshi: *See*—
Toyono, Tsutomu; and Onoda, Shigeyoshi, 4,540,268, Cl. 355-3.00R.
Onodera, Kaoru: *See*—
Nishijima, Toyoki; and Onodera, Kaoru, 4,540,653, Cl. 430-372.000.
Nishizima, Toyoki; Sasaki, Masao; and Onodera, Kaoru, 4,540,656, Cl. 430-505.000.
Sasaki, Masao; and Onodera, Kaoru, 4,540,658, Cl. 430-551.000.
Opitz, Wolfgang: *See*—
Jahrig, Siegfried; and Opitz, Wolfgang, 4,540,862, Cl. 200-144.00B.
Optimetrix Corporation: *See*—
Phillips, Edward H., 4,540,278, Cl. 355-55.000.
O'Regan, Timothy M.: *See*—
Burkum, Merlin E.; and O'Regan, Timothy M., 4,540,935, Cl. 324-52.000.
Orser, Cindy; Loper, Joyce; Panopoulos, Nickolas; Lindow, Steven; and Schroth, Milton N., to University of California, The Regents of the. Fluorescent siderophore genes. 4,540,667, Cl. 435-172.300.
Orvis, Victor R. Truss boom. 4,540,096, Cl. 212-177.000.
Orwoll, Richard D.: *See*—
Wissbrun, Kurt F.; and Orwoll, Richard D., 4,540,737, Cl. 524-599.000.
Osaka, Yoshiaki: *See*—
Kawasaki, Takao; Tsuchiya, Tadashi; and Osaka, Yoshiaki, 4,540,702, Cl. 514-369.000.

Osborne, Colin T., to Lucas Industries Public Limited Company. Apparatus for monitoring current levels in an a.c. transmission line. 4,540,939, Cl. 324-127.000.

Oshima, Noboru; Shimizu, Isamu; and Yoshimura, Yoshito, to Bridgestone Tire Company Limited; and Japan Synthetic Rubber Co., Ltd. Butadiene-base polymer and a process for producing the same. 4,540,744, Cl. 525-332.900.

Oshima, Yutaka, to Nippon Gakki Seizo Kabushiki Kaisha. Ivorylike composition plate for covering a wooden base and a method for producing the same. 4,540,440, Cl. 106-148.000.

Osselaere, Guy H. J., to Sperry Corporation. Offset grain loss sensor for combine harvesters. 4,540,003, Cl. 130-27.00T.

Ost, Clarence S. Color photographic reproduction system. 4,540,276, Cl. 355-38.000.

Otake, Katsumasa; Omura, Takashi; Kayane, Yutaka; and Imada, Kunihiko, to Sumitomo Chemical Company, Limited. Reactive dye composition. 4,540,418, Cl. 8-524.000.

Otake, Masatoshi: *See*—
Horikoshi, Tatsuo; Yonezawa, Seiji; Tsuyoshi, Toshiaki; Tooyama, Hiroshi; and Otake, Masatoshi, 4,541,082, Cl. 369-44.000.

Otari Electric Co., Ltd.: *See*—
Collette, Michael L., 4,541,023, Cl. 360-73.000.

Otis Engineering Corporation: *See*—
Gazda, Imre I., 4,540,048, Cl. 166-214.000.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Takao, Hisashi, 4,540,708, Cl. 514-469.000.

Otsuka, Kanji; Mitsusada, Kazumichi; Sekibata, Masao; and Ohnishi, Shinji, to Hitachi, Ltd. Semiconductor device including an alpha-particle shield. 4,541,003, Cl. 357-74.000.

Otsuka Pharmaceutical Company, Limited: *See*—
Uchida, Minoru; Nishi, Takao; and Nakagawa, Kazuyuki, 4,540,703, Cl. 514-381.000.

Ottaviani, Robert A.: *See*—
Short, William T.; Ottaviani, Robert A.; and Hart, Donald J., 4,540,734, Cl. 524-507.000.

Otto, Konrad: *See*—
Schneider, Walter; Ebert, Klaus-Peter; and Otto, Konrad, 4,540,183, Cl. 277-1.000.

Oulton, David B., to Pylon Electronic Development Co., Ltd. Talk filtered power supply. 4,540,932, Cl. 323-266.000.

Outokumpu Oy: *See*—
Jarvinen, Erkki J.; Taskinen, Pekka M.; Pullo, Jarmo J.; Kinnunen, Seppo T.; and Andersson, Arvo E., 4,540,290, Cl. 366-286.000.

Overbo, Gordon I. Captive column. 4,539,785, Cl. 52-309.100.

Overmeer, Robert: *See*—
Massengeil, Hans A.; Overmeer, Robert; Pietruska, Joachim; and Caufriez, Jean J., 4,540,166, Cl. 271-3.100.

Owens-Corning Fiberglas Corporation: *See*—
Heubach, Edward C., 4,541,098, Cl. 373-36.000.

Owens-Illinois, Inc.: *See*—
Swartzbaugh, Peter T.; and Hehl, Edward M., 4,540,099, Cl. 215-252.000.

Owoc, James R.; and Tremblay, Richard P., to Kerotest Manufacturing Corp. Bellows sealed stem for rotary valve. 4,540,019, Cl. 137-557.000.

Oy Nokia AB: *See*—
Pukkila, Olli J., 4,540,338, Cl. 415-219.00C.

Oyagi, Shuji: *See*—
Fukumoto, Ryutaro; Oyagi, Shuji; Yoshida, Yukio; and Akimoto, Ryosaku, 4,540,040, Cl. 165-12.000.

Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, to Pioneer Electronic Corporation. Amplifier circuit. 4,540,951, Cl. 330-267.000.

Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; Hatanaka, Masataka; Hirose, Masayoshi; and Kudo, Masaki, to Nissan Chemical Industries Ltd. Insecticidal 1-N-phenylcarbamoyl-3-(4-difluoromethoxyphenyl)-4-phenyl-2-pyrazoline derivatives. 4,540,706, Cl. 514-403.000.

Ozawa, Shuji: *See*—
Ishikawa, Katsutoshi; Shimotori, Hitoshi; Iida, Noboru; Akihiro, Kazuo; and Ozawa, Shuji, 4,540,698, Cl. 514-270.000.

Ozen Corporation: *See*—
Koike, Eishi, 4,541,085, Cl. 369-65.000.

Paap, Hans J., to Texaco Inc. Acoustic method and apparatus for measuring thickness of a coating layer on a substrate. 4,539,847, Cl. 73-579.000.

Pschschwoll, Heino, to Zevatron GmbH Gesellschaft fur Fertigungseinrichtungen der Elektronik. Apparatus for soldering workpieces. 4,540,114, Cl. 228-37.000.

Packaging Corporation International: *See*—
Shirley, Gaylord R.; and Chiodo, Daniel J., 4,539,988, Cl. 128-314.000.

Palin, Philip R.: *See*—
Miller, Gabriel M.; Cowen, Timothy B.; and Palin, Philip R., 4,540,405, Cl. 604-232.000.

Palmquist, Steven R.: *See*—
Sutton, Steven R.; Hagen, Michael S.; Chapman, David D.; Gombert, Glenn S.; and Palmquist, Steven R., 4,541,100, Cl. 375-10.000.

Pandolfi, Alberto, to Brevetti Gaggia S.p.A. Apparatus for producing ice cream utilizing the Peltier effect. 4,540,288, Cl. 366-145.000.

Panke, Gunter: *See*—
Gerking, Luder; and Panke, Gunter, 4,540,774, Cl. 528-502.000.

Panopoulos, Nickolas: *See*—
Orser, Cindy; Loper, Joyce; Panopoulos, Nickolas; Lindow, Steven; and Schroth, Milton N., 4,540,667, Cl. 435-172.300.

Paoluccio, John A. Apparatus for cleaning flue gases and other gases. 4,539,916, Cl. 110-203.000.

Papenfuhs, Theodor; and Hintzmann, Manfred, to Hoechst Aktiengesellschaft. Process for the preparation of pure 3-acetylamino-anilines. 4,540,815, Cl. 564-216.000.

Papenfuhs, Theodor: *See*—
Arndt, Otto; and Papenfuhs, Theodor, 4,540,832, Cl. 568-711.000.

Papierfabrik Laakirchen Aktiengesellschaft: *See*—
Habock, Wilhelm, 4,540,091, Cl. 206-494.000.

Paping, Max G.; and Goossens, Bjorn O., to Maxilin B.V. Folding caddy. 4,540,196, Cl. 280-646.000.

Papp, Laszlo : *See*—
Kiszel, Janos; Papp, Laszlo ; and Nagy, Laszlo , 4,539,984, Cl. 128-204.230.

Pappo, Raphael: *See*—
Nysted, Leonard N.; and Pappo, Raphael, 4,540,801, Cl. 549-465.000.

Papuga, Donald M.: *See*—
Matzner, Markus; and Papuga, Donald M., 4,540,748, Cl. 525-420.000.

Pariani, Emilio, to Costruzioni Aeronautiche Giovanii Agusta S.p.A. Helicopter rotor. 4,540,340, Cl. 416-145.000.

Park, David B.: *See*—
Cowdery, James R.; Park, David B.; and Khoylian, Rouzas R., 4,540,083, Cl. 198-465.100.

Park, John N., to General Electric Company. Peak turn-on current limiting base drive. 4,540,894, Cl. 307-254.000.

Park, John N.; and Steigerwald, Robert L., to General Electric Company. Full load to no-load control for a voltage fed resonant inverter. 4,541,041, Cl. 363-41.000.

Park Trading Co., Ltd.: *See*—
Ochi, Akira; and Asada, Toshihiko, 4,540,063, Cl. 181-135.000.

Parsons, Donald F.; Parsons, Gerald J.; Greenwald, Brian D.; and Parsons, Elizabeth A., to Communications Test Design, Inc. Circuit testing of telephone grids or the like. 4,540,857, Cl. 179-175.210.

Parsons, Elizabeth A.: *See*—
Parsons, Donald F.; Parsons, Gerald J.; Greenwald, Brian D.; and Parsons, Elizabeth A., 4,540,857, Cl. 179-175.210.

Parsons, Gerald J.: *See*—
Parsons, Donald F.; Parsons, Gerald J.; Greenwald, Brian D.; and Parsons, Elizabeth A., 4,540,857, Cl. 179-175.210.

Pastor, Stephen D.: *See*—
Spivack, John D.; Pastor, Stephen D.; and Odorisio, Paul, 4,540,732, Cl. 524-289.000.

Pasvyanskas, Arunas V.: *See*—
Chuiko, Alexei A.; Morev, Anatoly V.; Golovkov, Alexandr S.; Smirnov, Valentin A.; Voronin, Evgeny F.; Evlakhova, Raisa A.; Guba, Galina Y.; Slushnene, Iolita R.; Pasvyanskas, Arunas V.; and Sushko, Roman V., 4,540,652, Cl. 430-84.000.

Patel, Krishnakant B., to Alcan Aluminum Corporation. Tin alloy powder for sintering. 4,540,437, Cl. 75-251.000.

Patel, Navin D.: *See*—
Bell, Cecil R., Jr.; Lathery, Willie M.; Patel, Navin D.; and London, Jasper R., 4,539,924, Cl. 112-262.200.

Pattern Processing Technologies, Inc.: *See*—
Werth, Larry J., 4,541,115, Cl. 282-14.000.

Paul Wurth S.A.: *See*—
Kremer, Andre ; and Wolwert, Marcel, 4,540,058, Cl. 177-255.000.

Pavelka, Edwin A.; Grindstaff, Quirinus G.; and Scheppele, Stuart E., to United States of America, Energy. Metal-to-ceramic attachment device. 4,540,304, Cl. 403-12.000.

Pawelzik, Manfred, to Friedrich Grohe Armaturenfabrik GmbH & Co. Sanitary mixing valve. 4,540,023, Cl. 137-625.170.

Pawlicki, Richard I.: *See*—
Norrie, Lyle W.; and Pawlicki, Richard I., 4,540,094, Cl. 211-113.000.

Peck, Alan M.; Reedman, David C.; Graveling, Frederick J.; Moore, David; and Mansfield, Graham J., to USM Corporation. Determining an operating path of a tool in relation to a three-dimensional surface of a workpiece. 4,541,054, Cl. 364-474.000.

Pedersen, Karsten; Rostrup-Nielsen, Jens R.; Jorgensen, Ib Greve H.; and Andersen, Kjeld J., to Haldor Torsoe A/S. Process and catalyst for the preparation of a gas mixture having a high content of methane. 4,540,714, Cl. 518-714.000.

Peelle, Thomas B.: *See*—
Brown, Bernard J.; and Peelle, Thomas B., 4,539,777, Cl. 51-165.00R.

Peers-Trevarton, Charles A., to Cordis Corporation. Quick lock/quick release connector. 4,540,236, Cl. 339-45.00R.

Peffer, John R.: *See*—
Ambrose, Ronald R.; Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., 4,540,771, Cl. 528-272.000.

Peffley, Thomas R.: *See*—
Brisbane, Roger M.; and Peffley, Thomas R., 4,539,963, Cl. 123-494.000.

Peiffer, Dennis G.; Lundberg, Robert D.; Walker, Thad O.; and Turner, S. Richard, to Exxon Research & Engineering Company. Intramolecular polymer complexes - viscosifiers for high ionic strength drilling fluids. 4,540,496, Cl. 252-8.50A.

Pelham, Russell W.: *See*—
Wood, Grace; Duce, Benjamin R.; Pelham, Russell W.; and Woiszwillo, James, 4,540,410, Cl. 604-56.000.

Pelletier, Jean; Filion, Gilles; and Potvin, Clement, to Industries Tanguay Inc. Tree harvesting machine. 4,540,032, Cl. 144-3.00D.

Pelly, Brian R., to International Rectifier Corporation. Hammer drive circuit using power MOSFETs. 4,540,899, Cl. 307-270.000.

Perkin-Elmer Censor Anstalt: *See—*
Mayer, Herbert; and Lobach, Ernst, 4,540,277, Cl. 355-53.000.
Perkins, Gerard T., to International Hydraulic Systems, Inc. Spherical gear pump. 4,540,343, Cl. 417-218.000.
Perrella, Andrew P., to United Technologies Corporation. Telescoping fuel probe. 4,540,144, Cl. 244-135.00A.
Personal Products Company: *See—*
Korpman, Ralf, 4,540,415, Cl. 604-390.000.
Pieniak, Heinz A.; and Iskra, Michael J., 4,540,454, Cl. 156-62.200.
Perzborn, Elisabeth: *See—*
Mardin, Mithat; Busse, Wolf-Dieter; Hoffmeister, Friedrich; Seuter, Friedel; Perzborn, Elisabeth; Schlossmann, Klaus; Mayer, Dieter; and Fiedler, Volker, 4,540,707, Cl. 514-404.000.
Petcen, Donald H.; and Sinclair, Robert I., to Coburn Optical Industries, Inc. Method and apparatus for molding ophthalmic lenses. 4,540,532, Cl. 264-1.100.
Peter, Josef: *See—*
Krasser, Fritz; and Peter, Josef, 4,540,864, Cl. 200-302.200.
Peters, Rex B.: *See—*
Lee, Charles K.; Peters, Rex B.; and Gogic, Aleksandar M., 4,541,105, Cl. 377-19.000.
Petro-Tex Chemical Corporation: *See—*
Keyworth, Donald A.; and McFarland, Cecil G., 4,540,839, Cl. 585-520.000.
Pfeiffer, Richard: *See—*
Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; and Pfeiffer, Richard, 4,540,536, Cl. 264-102.000.
Pfister GmbH: *See—*
Lewandowski, Reiner, 4,541,066, Cl. 364-580.000.
Pfister, Larry E.: *See—*
Johnson, William R.; and Pfister, Larry E., 4,540,472, Cl. 204-28.000.
Pfizer Inc.: *See—*
Kellogg, Michael S., 4,540,687, Cl. 514-193.000.
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, to Roussel Uclaf. 3-Keto-19-nor-$\Delta^{4,9}$-steroids. 4,540,686, Cl. 514-179.000.
Philip Morris, Incorporated: *See—*
Podraza, Kenneth F.; and Houminer, Yoram, 4,540,004, Cl. 131-277.000.
Phillips, Edward H., to Optimetrix Corporation. Optical focusing system. 4,540,278, Cl. 355-55.000.
Phillips Petroleum Company: *See—*
Banasiak, Dennis S.; and Byers, Jim D., 4,540,826, Cl. 568-420.000.
Boultinghouse, Harold D., 4,540,631, Cl. 428-419.000.
Hampton, Joe B., 4,540,422, Cl. 62-21.000.
Henderson, E. Webb; and Gravley, Mark L., 4,540,560, Cl. 423-445.000.
Hitzman, Donald O., 4,540,052, Cl. 166-303.000.
Hopkins, Thomas R., 4,540,668, Cl. 435-190.000.
Johnson, Timothy W.; and Stone, Mark L., 4,540,620, Cl. 428-195.000.
McDaniel, Max P., 4,540,757, Cl. 526-128.000.
Walsworth, Frank J., 4,539,949, Cl. 123-73.0AD.
Wishman, Marvin, 4,540,414, Cl. 604-378.000.
Phipps, Robert E.: *See—*
Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., 4,540,908, Cl. 310-326.000.
Picarello, Joseph F.: *See—*
Shaffer, Jacob E., Jr.; and Picarello, Joseph F., 4,540,874, Cl. 219-279.000.
Piccardi, Paolo: *See—*
Bettarini, Franco; Massardo, Pietro; Piccardi, Paolo; and Longoni, Angelo, 4,540,711, Cl. 514-720.000.
Pickar, Paul B.: *See—*
Bindra, Perminder S.; David, Allan P.; Galasco, Raymond T.; Gasdik, Charles E.; Light, David N.; and Pickar, Paul B., 4,540,473, Cl. 204-52.00R.
Pieniak, Heinz A.; and Iskra, Michael J., to Personal Products Company. Method of forming a superthin absorbent product. 4,540,454, Cl. 156-62.200.
Pierpaoli, Walter; and Maestroni, Georges, to Cellena (Cell Engineering) A.G.; and Choay S.A. Water soluble fraction capable of controlling the immune reactions of a host against allogenic cells or tissue, the pharmaceutical compositions containing said fraction and a process for preparing the latter. 4,540,574, Cl. 424-95.000.
Pierrel S.p.A.: *See—*
Toscano, Luciano; and Cappelletti, Leonard M., 4,540,662, Cl. 435-74.000.
Pierry, Anthony: *See—*
Doherty, Richard F.; and Pierry, Anthony, 4,540,000, Cl. 128-696.000.
Pietrini, Viktor: *See—*
Meile, Hanspeter; and Pietrini, Viktor, 4,539,729, Cl. 19-288.000.
Pietruska, Joachim: *See—*
Massengeil, Hans A.; Overmeer, Robert; Pietruska, Joachim; and Caufriez, Jean J., 4,540,166, Cl. 271-3.100.
Pike, Kelly, to American Hospital Supply Corporation. Transducer assembly including a disposable dome. 4,539,849, Cl. 73-715.000.
Pilarski, Regis V.: *See—*
Rogers, Lloyd W., Jr.; Pilarski, Regis V.; and Blake, Thomas B., 4,540,137, Cl. 242-107.600.
Piojda, Clarence F.: *See—*
Schmerda, Joseph M.; and Piojda, Clarence F., 4,540,223, Cl. 339-3.00S.

Pioneer Electronic Corporation: *See—*
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,540,951, Cl. 330-267.000.
Takaoka, Saburo; Naito, Ryuichi; Yokogawa, Fumihiko; and Ogawa, Youichi, 4,540,897, Cl. 307-268.000.
Tanaka, Kenji, 4,541,086, Cl. 369-271.000.
Yagi, Yasuo, 4,541,014, Cl. 358-166.000.
Pipa, William: *See—*
Turbowitz, Leslie; and Pipa, William, 4,540,376, Cl. 446-164.000.
Pipper, Gunter; Schmidt, Franz; Theysohn, Rainer; Riegger, Siegfried; Heil, Eduard; Fischer, Hermann; Thoma, Richard; and Matthies, Paul, to BASF Aktiengesellschaft. Continuous preparation of nylon from aqueous salt solution in precondensation zone having baffles. 4,540,772, Cl. 528-335.000.
Pitney Bowes Inc.: *See—*
Freeman, Gerald C., 4,540,057, Cl. 177-154.000.
Pitz, Hans P.: *See—*
Stewart, Iain G. H.; and Pitz, Hans P., 4,540,459, Cl. 156-504.000.
Plessey Overseas Limited: *See—*
Calder, John, 4,540,865, Cl. 200-340.000.
Marchent, Brian G.; and Foster, Michael R., 4,539,760, Cl. 33-356.000.
Plies, Erich; Weyl, Reinhard; and Lischke, Burkhard, to Siemens Aktiengesellschaft. Spectrometer objective having parallel objective fields and spectrometer fields for the potential measuring technique. 4,540,885, Cl. 250-310.000.
PLM AB: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,540,544, Cl. 264-532.000.
Pneumo Corporation: *See—*
Beidler, Glenn S., 4,540,186, Cl. 277-195.000.
Podraza, Kenneth F.; and Houminer, Yoram, to Philip Morris, Incorporated. Smoking compositions containing a flavorant-release additive. 4,540,004, Cl. 131-277.000.
Pointner, Martin; and Sommer, Rudiger, to Dr. -Ing. Rudolf Hell GmbH. Device for manufacturing multiple needle recording electrode. 4,540,151, Cl. 249-93.000.
Poisson, Regis: *See—*
Latourrette, Bertrand; and Poisson, Regis, 4,540,559, Cl. 423-329.000.
Poiaroid Corporation: *See—*
Alston, Lawrence E., 4,541,010, Cl. 358-44.000.
Blakely, Linda L.; and Seiden, Myron A., 4,540,259, Cl. 354-109.000.
Fantone, Stephen D., 4,540,246, Cl. 350-3.700.
Kramer, G. Richard, 4,540,263, Cl. 354-304.000.
Norris, Philip R.; and Wareham, Richard R., 4,540,255, Cl. 352-44.000.
Norris, Philip R.; and Wareham, Richard R., 4,540,256, Cl. 352-239.000.
Poler, Stanley. Eye-medicating haptic. 4,540,417, Cl. 604-895.000.
Poliniak, Eugene S., to RCA Corporation. High-density information disc lubricant. 4,540,615, Cl. 428-64.000.
Polyplastics Company, Ltd.: *See—*
Komazawa, Hiroyasu; Hotta, Hiroshi; Nakatsuji, Hiroshi; Yoko, Kiyoshi; Higashiyama, Seiichi; Nakashima, Tuneyasu; and Gotoh, Noboru, 4,540,773, Cl. 528-480.000.
Polysar Limited: *See—*
Midgley, Charles A., 4,540,739, Cl. 524-764.000.
Porco, Daniel. Portable security alarm. 4,540,980, Cl. 340-586.000.
Porrot, Pascal: *See—*
Rougeolle, Daniel; and Porrot, Pascal, 4,541,009, Cl. 358-13.000.
Portell, Jose E. Cards. 4,539,728, Cl. 19-105.000.
Porter, Samuel, Jr.: *See—*
Chang, Wen-Hsuan; Ambrose, Ronald R.; McKeough, David T.; Porter, Samuel, Jr.; and Eslinger, Delano R., 4,540,766, Cl. 528-45.000.
Potage, Jean; and Sidin, Philippe, to Thomson CSF. Process and device for voice interpolation in a transmission system for digitized voice. 4,541,101, Cl. 375-28.000.
Potter, James C.: *See—*
Redston, Hugh W.; and Potter, James C., 4,540,155, Cl. 251-129.200.
Potvin, Clement: *See—*
Pelletier, Jean; Filion, Gilles; and Potvin, Clement, 4,540,032, Cl. 144-3.00D.
Poulsen, Jorgen: *See—*
Baumbach, Per L.; and Poulsen, Jorgen, 4,539,994, Cl. 128-635.000.
PPG Industries, Inc.: *See—*
Ambrose, Ronald R.; Chang, Wen-Hsuan; McKeough, David T.; and Peffer, John R., 4,540,771, Cl. 528-272.000.
Chang, Wen-Hsuan; Ambrose, Ronald R.; McKeough, David T.; Porter, Samuel, Jr.; and Eslinger, Delano R., 4,540,766, Cl. 528-45.000.
Gagne, Robert, 4,540,361, Cl. 432-30.000.
Jerabek, Robert D.; Koren, Jeffrey G.; and Johnson, Mark W., 4,540,725, Cl. 523-400.000.
Olson, Kurt G.; Das, Suryya K.; and Dowbenko, Rostyslaw, 4,540,740, Cl. 524-811.000.
PQ Corporation: *See—*
Sands, Bruce W.; and Nehring, Robert J., Jr., 4,540,629, Cl. 428-402.000.
Pradier, Serge, to Salomon S.A. Adjustment apparatus for ski boot. 4,539,764, Cl. 36-121.000.

Prange, Charles J. Hose feeder guide apparatus. 4,540,017, Cl. 137-355.120.

Prantz, Erhard: *See—*
Ronge, Helmut; Prantz, Erhard; and Schoerkhuber, Wolfgang, 4,540,635, Cl. 428-498.000.

Prassas, Michel: *See—*
Boudot, Jean E.; Mazeau, Jean P.; and Prassas, Michel, 4,540,672, Cl. 501-65.000.

Precourt, Normand E., to Cipher Data Products, Inc. Recording system for recording data on tape in a disk-recording format. 4,541,019, Cl. 360-15.000.

Previero, Aldo: *See—*
Commeyras, Auguste; Previero, Aldo; and Pugniere, Martine, 4,540,792, Cl. 548-344.000.

Priaroggia, Paolo G., to Societa' Cavi Pirelli S.p.A. Method and apparatus for improving the dielectric strength of direct current cable insulation. 4,540,889, Cl. 307-2.000.

Pribat, Didier: *See—*
Croset, Michel; Dieumegard, Dominique; and Pribat, Didier, 4,540,452, Cl. 148-175.000.

Priegnitz, Ronald D., to Quaker Oats Company, The. Food products containing α-amylase and process. 4,540,585, Cl. 426-28.000.

Prize Frize, Inc.: *See—*
Bartfield, William, 4,540,588, Cl. 426-231.000.

Procter & Gamble Company, The: *See—*
Staller, Kerry P., 4,540,721, Cl. 523-102.000.

Procyk, Frank J.: *See—*
Dumbri, Austin C.; and Procyk, Frank J., 4,541,078, Cl. 365-230.000.

Progressive Recovery, Inc.: *See—*
Fluchel, Donald G., 4,540,471, Cl. 202-175.000.

Propster, John A.; and Rowan, John H., to Hughes Aircraft Company. Modular programmable signal processor. 4,541,048, Cl. 364-200.000.

Proter S.p.A.: *See—*
DeBarbieri, Augusto; and Bekesi, Julius G., 4,540,683, Cl. 514-18.000.

Prue, Walter W., Jr.: *See—*
Faulkner, Neil P.; and Prue, Walter W., Jr., 4,541,065, Cl. 364-571.000.

Prugh, John D., to Merck & Co., Inc. Process for preparing inhibitors of 3-hydroxy-3-methylglutaryl coenzyme a reductase via a chiral synthon. 4,540,796, Cl. 549-292.000.

Psytronics Associates: *See—*
Rubenstein, Charles P.; Nevid, Jeffrey S.; and Rathus, Spencer A., 4,540,292, Cl. 368-29.000.

Pugniere, Martine: *See—*
Commeyras, Auguste; Previero, Aldo; and Pugniere, Martine, 4,540,792, Cl. 548-344.000.

Pukkila, Olli J., to Oy Nokia AB. Suction chamber in a fan. 4,540,338, Cl. 415-219.00C.

Pullo, Jarmo J.: *See—*
Jarvinen, Erkki J.; Taskinen, Pekka M.; Pullo, Jarmo J.; Kinnunen, Seppo T.; and Andersson, Arvo E., 4,540,290, Cl. 366-286.000.

Pumo, Joseph; and Belleville, Marc J. E., to Motorola, Inc. Clocked buffer circuit using a self-bootstrapping transistor. 4,540,898, Cl. 307-269.000.

Pylon Electronic Development Co., Ltd.: *See—*
Oulton, David B., 4,540,932, Cl. 323-266.000.

Pyromid, Inc.: *See—*
Hait, Paul W., 4,539,973, Cl. 126-43.000.

Quaker Oats Company, The: *See—*
Priegnitz, Ronald D., 4,540,585, Cl. 426-28.000.

Quinn, Chester P.: *See—*
Szlam, Aleksander; and Quinn, Chester P., 4,540,855, Cl. 179-84.00R.

R. J. Reynolds Tobacco Company: *See—*
Hester, Benny L.; and Graves, William H., Jr., 4,539,836, Cl. 73-49.300.
Lortie, Richard P.; and Adams, William R., 4,540,118, Cl. 236-44.00C.
Wilkinson, Donald R., 4,539,795, Cl. 53-542.000.

R. W. Beckett Corporation: *See—*
Keener, Robert M.; and Chakrawarti, Shekhar, 4,540,891, Cl. 307-118.000.

Rabatin, Jacob G., to General Electric Company. X-Ray image converter devices utilizing rare earth oxyhalide phosphors. 4,540,599, Cl. 427-65.000.

Racal-Milgo, Inc.: *See—*
Kromer, Philip F., III, 4,541,045, Cl. 364-200.000.

Rachi, Kazuo; Kubota, Shouichi; and Sasaki, Isamu, to Nippon Suisan Kabushiki Kaisha. Process for producing fibrous simulated sea foods packaged in hermetically sealed containers. 4,540,589, Cl. 426-250.000.

Radiometer A/S: *See—*
Baumbach, Per L.; and Poulsen, Jorgen, 4,539,994, Cl. 128-635.000.

Radisch, Helmer: *See—*
Brunion, Hans-Georg; Hiemenz, Christian; Heuser, Hans; and Radisch, Helmer, 4,540,622, Cl. 428-216.000.

Rado, Theodore A., to Kerr-McGee Chemical Corporation. Salt removal from treated titanium dioxide. 4,540,441, Cl. 106-300.000.

Radochonski, Pierre: *See—*
Biggs, Lawrence G.; and Radochonski, Pierre, 4,540,997, Cl. 346-140.00R.

Ragaly, Istvan: *See—*
Hagenlocher, Walter; Rapp, Lutz; Eschen, Werner; Ragaly, Istvan; Scharpf, Heinz; Streller, Jorg; Weigand, Johann; and Winkler, Klaus, 4,540,907, Cl. 310-68.00D.

Raichle Sportschuh AG: *See—*
Walkhoff, Klaus, 4,539,763, Cl. 36-120.000.

Rakov, David M., to Eastman Kodak Company. Electrophotographic apparatus having improved, fixed-contact grounding structure. 4,540,271, Cl. 355-3.00R.

Ram Corporation: *See—*
Hodge, Raymond P., 4,539,713, Cl. 2-8.000.

Ramachandran, Venkataraman, to Ethyl Corporation. Substituted pyridines. 4,540,793, Cl. 546-346.000.

Ramsden, Hugh E., to J. T. Baker Chemical Company. Polyethylenimine bound chromatographic packing. 4,540,486, Cl. 210-198.200.

Ramsey, Earl A., to Maxi-Lift, Inc. Belt splicing device. 4,540,389, Cl. 474-257.000.

Ramu International: *See—*
Smith-Johannsen, Robert, 4,540,195, Cl. 280-610.000.

Randall, Russel R., to Dresser Industries, Inc. Background correction method and apparatus for pulsed neutron logging of earth boreholes. 4,540,883, Cl. 250-262.000.

Rapp, A. Karl, to National Semiconductor Corporation. Self compensating ROM circuit. 4,541,077, Cl. 365-210.000.

Rapp, Lutz: *See—*
Hagenlocher, Walter; Rapp, Lutz; Eschen, Werner; Ragaly, Istvan; Scharpf, Heinz; Streller, Jorg; Weigand, Johann; and Winkler, Klaus, 4,540,907, Cl. 310-68.00D.

Rappinger, Bo; and Stenkvist, Sven-Einar, to ASEA Aktiebolag. DC Arc furnace improved hearth construction. 4,541,099, Cl. 373-72.000.

Rasch, Klaus-Dieter: *See—*
Gochermann, Hans; Schmidt, Wilfried; Rasch, Klaus-Dieter; and Tentscher, Karl-Heinz, 4,540,843, Cl. 136-251.000.

Raschack, Manfred: *See—*
Franke, Albrecht; Muller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Gunther; Muller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,540,697, Cl. 514-255.000.

Rasshofer, Werner; Grogler, Gerhard; Konig, Klaus; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Polyamines, a process for the production of polyamines and their use in the production of polyurethanes. 4,540,720, Cl. 521-159.000.

Rathus, Spencer A.: *See—*
Rubenstein, Charles P.; Nevid, Jeffrey S.; and Rathus, Spencer A., 4,540,292, Cl. 368-29.000.

Ratliff, Hershel E.: *See—*
Gilmore, Thomas F.; and Ratliff, Hershel E., 4,540,616, Cl. 428-131.000.

Ratzel, Richard O.: *See—*
Myers, Carl J.; and Ratzel, Richard O., 4,539,876, Cl. 82-32.000.

Rauch, William H. Fishing line loader apparatus. 4,540,136, Cl. 242-106.000.

Rawlings, Derek A.: *See—*
Brown, Thomas H.; and Rawlings, Derek A., 4,540,699, Cl. 514-272.000.

Raychem Corporation: *See—*
Vogdes, Christine E., 4,540,727, Cl. 524-83.000.

RCA Corporation: *See—*
Carvalho, John A., 4,540,892, Cl. 307-130.000.
Hawrylo, Frank Z., 4,540,115, Cl. 228-123.000.
Poliniak, Eugene S., 4,540,615, Cl. 428-64.000.
Schanne, Joseph F.; and Elliott, Lewis D., 4,540,974, Cl. 340-347.0AD.
Tower, John R., 4,541,068, Cl. 364-825.000.

RDC Electronics Inc.: *See—*
Mallok, Horst; Brown, Howard; and Iacampo, Marco, 4,540,478, Cl. 204-297.00W.

Ream, Bernard C.; and Tellis, Cyril, to Union Carbide Corporation. Process for the removal of acid gases from a gas mixture. 4,540,552, Cl. 423-226.000.

Redston, Hugh W.; and Potter, James C., to Lucas Industries, public limited company. Fluid control valves. 4,540,155, Cl. 251-129.200.

Reece, Alan R., to British Petroleum Company p.l.c., The. Trench backfill device. 4,539,765, Cl. 37-142.500.

Reed, Claude A., to International Food Equipment, Inc. Apparatus for heating food products. 4,539,900, Cl. 99-353.000.

Reed, William R., Jr.: *See—*
Lee, Minyoung; Reed, William R., Jr.; and Szala, Lawrence E., 4,539,875, Cl. 82-1.00C.

Reedman, David C.: *See—*
Peck, Alan M.; Reedman, David C.; Graveling, Frederick J.; Moore, David; and Mansfield, Graham J., 4,541,054, Cl. 364-474.000.

Regulation Technology, Inc.: *See—*
Hahn, Steven, 4,540,931, Cl. 323-264.000.

Rehkemper, Steven F.; Hanson, Steven P.; and Disko, Harry, to Marvin Glass & Associates. Toy vehicle conversion accessory. 4,540,377, Cl. 446-430.000.

Reifferscheid, Karl J.: *See—*
Wolfsgruber, Friedrich; Weiser, Ernst A.; Gmohling, Werner; Kern, Hans; and Reifferscheid, Karl J., 4,540,436, Cl. 75-130.00A.

Reischer, Wilhelm: *See—*
Kolzer, Walter; and Reischer, Wilhelm, 4,540,926, Cl. 318-609.000.

Reith, Michael W.: *See—*
Mayer, Robert A.; Reith, Michael W.; and Odell, Jack L., II, 4,541,011, Cl. 358-106.000.
Rekers, Louis J.: *See—*
Mayhew, Harry W.; French, Richard J.; and Rekers, Louis J., 4,540,755, Cl. 526-100.000.
Reliable Security Systems, Inc.: *See—*
Logan, Emanual L., Jr.; Sommers, Walter M.; and Walsh, J. William, 4,540,208, Cl. 292-341.190.
Remington Products, Inc.: *See—*
Wegrzyn, Richard J., 4,540,976, Cl. 340-539.000.
Renault Vehicules Industriels: *See—*
Molimar, Maurice, 4,539,845, Cl. 73-578.000.
Renker, Wolfgang: *See—*
Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Renker, Wolfgang; and Kober, Roland, 4,540,494, Cl. 210-750.000.
Research Environmental/Institute of Michigan: *See—*
Rutenbar, Robin A.; and Lougheed, Robert M., 4,541,114, Cl. 382-8.000.
Ress, Robert A., Jr.: *See—*
Landries, Richard V.; and Ress, Robert A., Jr., 4,541,036, Cl. 361-426.000.
Retsco, Inc.: *See—*
Jordan, Larry B., 4,540,159, Cl. 254-228.000.
Reusser, Fritz: *See—*
Hannon, Betty R.; Reusser, Fritz; Dolak, Lester A.; Argoudelis, Alexander D.; and Castle, Thomas M., 4,540,661, Cl. 435-42.000.
Rezy, Bernard J., to Teledyne Industries. Air cooled exhaust valve. 4,539,812, Cl. 60-304.000.
Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft: *See—*
Franke, Paul W. U.; Glaser, Wolfgang; Gebhard, Georg R. U.; and Hein, Klaus R. G., 4,540,555, Cl. 423-242.000.
Rhodes, George F.: *See—*
Battle, Billy J.; Graham, Robert M.; Jones, Lawrence S.; Malizio, Andrew B.; and Rhodes, George F., 4,540,204, Cl. 285-231.000.
Rhone-Poulenc Specialites Chimiques: *See—*
Cordier, Georges, 4,540,834, Cl. 568-774.000.
Latourrette, Bertrand; and Poisson, Regis, 4,540,559, Cl. 423-329.000.
Rhyner, Edison L., to Sealtran Corporation. Foldable sheet plastic products. 4,540,612, Cl. 428-35.000.
Rice, Paul G.: *See—*
Grady, John K.; and Rice, Paul G., 4,541,108, Cl. 378-196.000.
Rice, William C., to Dalworth Construction Inc. Storm cellar or the like. 4,539,780, Cl. 52-169.600.
Richardson, Julian H.: *See—*
Eastmond, Bruce C.; and Richardson, Julian H., 4,541,118, Cl. 455-35.000.
Richardson, Ryden L.: *See—*
Simpson, Howard D.; Richardson, Ryden L.; and Angmorter, Paul K., 4,540,483, Cl. 208-216.0PP.
Richardson, William D., to Tuthill Corporation. Tube connector. 4,540,201, Cl. 285-101.000.
Richter, Horst: *See—*
Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Renker, Wolfgang; and Kober, Roland, 4,540,494, Cl. 210-750.000.
Ricoh Co., Ltd.: *See—*
Tsutsui, Kyoji, 4,540,643, Cl. 430-58.000.
Riedel, Kenneth E.: *See—*
Nystrom, Wilford O.; Riedel, Kenneth E.; and Doerschner, David L., 4,540,409, Cl. 604-349.000.
Riegger, Siegfried: *See—*
Pipper, Gunter; Schmidt, Franz; Theysohn, Rainer; Riegger, Siegfried; Heil, Eduard; Fischer, Hermann; Thoma, Richard; and Matthies, Paul, 4,540,772, Cl. 528-335.000.
Rieter Machine Works Ltd.: *See—*
Meile, Hanspeter; and Pietrini, Viktor, 4,539,729, Cl. 19-288.000.
Rikagaku Kenkyusho: *See—*
Ohta, Hiroshi, 4,539,741, Cl. 29-569.00R.
Rikukawa, Hiroshi: *See—*
Torii, Michihiro; Kosaka, Tomoyoshi; Maeda, Takeo; and Rikukawa, Hiroshi, 4,540,500, Cl. 252-62.580.
Risvin - Ricerche e Sviluppo Industriale S.r.l.: *See—*
Zamboni, Alderino, 4,539,790, Cl. 53-227.000.
Zamboni, Alderino, 4,539,791, Cl. 53-234.000.
Zamboni, Alderino, 4,539,792, Cl. 53-234.000.
Ritsema, Irving R., to Allied Corporation. Disc brake. 4,540,068, Cl. 188-73.390.
Ritter, Gerhard; and Ritter, Klaus, to AVI Alpenlandische Veredelungs-Industrie Gesellschaft m.b.H. Reinforcement mat for reinforced concrete. 4,539,787, Cl. 52-664.000.
Ritter, Klaus: *See—*
Ritter, Gerhard; and Ritter, Klaus, 4,539,787, Cl. 52-664.000.
Riutta, Raine R. Measuring apparatus. 4,539,758, Cl. 33-180.0AT.
Rivier, Jean-Jacques. Construction panel. 4,540,241, Cl. 350-261.000.
Rizkalia, Nabil, to Halcon SD Group, Inc., The. Preparation of carboxylic acid esters. 4,540,811, Cl. 560-233.000.
Robert, Andre : *See—*
Levy, Pierre; and Robert, Andre , 4,540,139, Cl. 244-3.190.
Levy, Pierre; and Robert, Andre , 4,540,140, Cl. 244-3.190.
Robert Bosch GmbH: *See—*
Djordjevic, Ilja; Eheim, Franz; and Laufer, Helmut, 4,539,964, Cl. 123-509.000.
Hagenlocher, Walter; Rapp, Lutz; Eschen, Werner; Ragaly, Istvan; Scharpf, Heinz; Streller, Jorg; Weigand, Johann; and Winkler, Klaus, 4,540,907, Cl. 310-68.00D.
Hornung, Friedrich; and Schadlich, Fritz, 4,540,318, Cl. 408-9.000.
Stein, Helmut, 4,539,747, Cl. 29-846.000.
Roberts, Craig P.: *See—*
Litzie, Ken; and Roberts, Craig P., 4,540,399, Cl. 607-4.000.
Roberts, E.: *See—*
Long, Ballard E., 4,539,923, Cl. 112-224.000.
Roberts, Simon. Tire repair patch. 4,540,035, Cl. 152-367.000.
Roberts, Victor C.: *See—*
Sainz, Antonio J.; and Roberts, Victor C., 4,540,946, Cl. 328-167.000.
Roberts, Winston J., to Du Pont de Nemours, E. I., and Company. Polyamide fiber. 4,540,746, Cl. 525-408.000.
Robinair Division: *See—*
Murray, Gary P., 4,540,353, Cl. 418-13.000.
Rochat, Alain C.: *See—*
Cassar, Luigi; Iqbal, Abul; and Rochat, Alain C., 4,540,791, Cl. 546-335.000.
Roche, Michel, to Benson S.A. Pencil device for plotting machine. 4,540,995, Cl. 346-139.00C.
Rockwell International Corporation: *See—*
Apel, Thomas R., 4,540,954, Cl. 330-286.000.
Walsh, Raymond F., IV, 4,541,096, Cl. 372-59.000.
Roeth, Kenneth M.; and Ihm, Gerald J., to Deere & Company. Means of securing an axle to frame. 4,540,220, Cl. 301-125.000.
Rogers, Lloyd W., Jr.; Pilarski, Regis V.; and Blake, Thomas B., to General Motors Corporation. Inertia release for belt retractor winding prevention mechanism. 4,540,137, Cl. 242-107.600.
Rogers, Russell L., to Aeroquip Corporation. Balanced valve coupling. 4,540,021, Cl. 137-614.050.
Roggen, Rolf, to Swiss Aluminium Ltd. Process and device for feeding metal into a molten metal bath. 4,540,434, Cl. 75-93.00R.
Rogic, Milorad M.: *See—*
Van Der Puy, Michael; Hendrickson, Larry L.; Kolc, Jaroslav F.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,540,428, Cl. 71-28.000.
Rogier, Leonce, to SO.M.A. Europe Transmission-Societe Nouvelle Mecanique et Automobile. Wheel hub with reduction gear and multiple disc brake. 4,540,073, Cl. 192-4.00A.
Roman, Daniel P., Jr.; and Fruitstone, Mitchell J., to American Hospital Supply Corporation. Reduced IgG in low ionic strength medium for immunohematologic agglutination. 4,540,565, Cl. 424-11.000.
Romanski, Eric R., to Albany International Corp. Seaming means and a tool for forming the seam. 4,539,730, Cl. 24-33.00B.
Ronge, Helmut; Prantz, Erhard; and Schoerkhuber, Wolfgang, to Krems-Chemie, Gesellschaft mbH. Modified colophony rosins, a process for their preparation, their use and paper-sizing agents containing such modified colophony rosins. 4,540,635, Cl. 428-498.000.
Roquemore, Glenn R.; Smith, Patrick E.; and Banks, Eric W., to United States of America, Navy. Method for exploratory trench wall stabilization. 4,540,315, Cl. 405-264.000.
Rose, Daniel C.: *See—*
Chu, Mike S. H.; Hodgkins, Charles E.; and Rose, Daniel C., 4,540,676, Cl. 501-138.000.
Rosenmeier, Gordon: *See—*
DuFrene, Clement O., 4,539,920, Cl. 111-2.000.
Roser, Dieter: *See—*
Kerpers, Werner; Bonk, Werner; Roser, Dieter; and Fuhrer, Hans-Jurgen, 4,539,737, Cl. 29-423.000.
Ross, David G., to AT&T Bell Laboratories. Wideband linear amplifier. 4,540,950, Cl. 330-267.000.
Ross, Robert H.; and Larko, Robert C., to Seco/Warwick Corporation. Ingot pusher furnace. 4,540,363, Cl. 432-148.000.
Ross, Sidney D.; and Finkelstein, Manuel, to Sprague Electric Company. Aluminum electrolytic capacitor. 4,541,037, Cl. 361-433.000.
Rossi, Remo J., to Grady, John K. Moving X-ray mask with spiral window. 4,541,107, Cl. 378-146.000.
Rostrup-Nielsen, Jens R.: *See—*
Pedersen, Karsten; Rostrup-Nielsen, Jens R.; Jorgensen, Ib Greve H.; and Andersen, Kjeld J., 4,540,714, Cl. 518-714.000.
Rothwell, Harold L.; and English, George J., to GTE Products Corporation. Method of fabricating an arc tube for an arc discharge lamp. 4,540,373, Cl. 445-22.000.
Rougeolie, Daniel; and Porrot, Pascal, to Thomson CSF. Process and device for sampling a sine wave signal by a multiple frequency signal. 4,541,009, Cl. 358-13.000.
Roussel Uclaf: *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,540,797, Cl. 549-302.000.
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 4,540,686, Cl. 514-179.000.
Rowan Corporation: *See—*
Kulow, Howard H., 4,540,298, Cl. 400-635.000.
Rowan, John H.: *See—*
Propster, John A.; and Rowan, John H., 4,541,048, Cl. 364-200.000.
Rubenstein, Charles P.; Nevid, Jeffrey S.; and Rathus, Spencer A., to Psytronics Associates. Electronic calendar display. 4,540,292, Cl. 368-29.000.
Rubner, Michael F.: *See—*
McDonald, Robert C.; Wang, Wei-Tao; Cukor, Peter; and Rubner, Michael F., 4,540,641, Cl. 429-105.000.
Runkle, Charles J., to Monsanto Company. Process for severing a tube sheet. 4,540,109, Cl. 225-1.000.
Rupprecht, Hans; and Hoyss, Franz, to Hilti Aktiengesellschaft. Stand for a drilling tool. 4,540,149, Cl. 248-669.000.
Russo, Ronald D. Cardiopulmonary drainage collector with blood transfer adapter. 4,540,413, Cl. 604-320.000.

Rutenbar, Robin A.; and Lougheed, Robert M., to Research Environmental/Institute of Michigan. Routing techniques using serial neighborhood image analyzing system. 4,541,114, Cl. 382-8.000.
Rutsch, Werner: *See*—
Berner, Godwin; and Rutsch, Werner, 4,540,598, Cl. 427-54.100.
Ryan, John O., to Ampex Corporation. Method and apparatus for automatically controlling highlight effects. 4,540,919, Cl. 315-384.000.
Ryan, William P.: *See*—
Schroeder, Thaddeus; and Ryan, William P., 4,539,841, Cl. 73-116.000.
Ryobi Ltd.: *See*—
Uetsuki, Haruo; and Kobayashi, Takehiro, 4,540,135, Cl. 242-84.51R.
Ryu, Toshihiko, to NEC Corporation. 8-Phase phase-shift keying demodulator. 4,540,948, Cl. 329-122.000.
S. C. Johnson & Son, Inc.: *See*—
Malek, Edward J., 4,539,793, Cl. 53-469.000.
S.I.T.I. Societa Impianti Termoelettrici Industriali S.p.A.: *See*—
Bossetti, Renato, 4,539,919, Cl. 110-331.000.
S. Soga & Co.: *See*—
Saito, Toru, 4,541,033, Cl. 361-333.000.
Saad, Saad S., to Andrew Corporation. Rectangular to elliptical waveguide connection. 4,540,959, Cl. 333-21.00R.
Saad, Samy K.: *See*—
Kucera, Helmut W.; and Saad, Samy K., 4,540,633, Cl. 428-423.100.
Saegusa, Takeo; Kobayashi, Shiro; and Moriuchi, Yasuhiro, to Sumitomo Chemical Company, Limited; and Saegusa, Takeo. Block copolymer. 4,540,747, Cl. 525-410.000.
Sahakian, Diran-Robert, to U.S. Philips Corporation. Method of encapsulating electronic components by extrusion of plastic material. 4,540,533, Cl. 264-1.400.
Sahara, Masayoshi: *See*—
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,540,262, Cl. 354-195.130.
Saijo, Eiji; and Wakata, Shigekazu, to Tokai Electric Wire Company Limited. Female electrical terminal having improved contactor block structure. 4,540,233, Cl. 339-258.00R.
Saint-Gobain Vitrage: *See*—
Bocelli, Aureliano; and Colombini, Carlo, 4,540,425, Cl. 65-273.000.
Bocelli, Aureliano; and Colombini, Carlo, 4,540,426, Cl. 65-273.000.
Brunion, Hans-Georg; Hiemenz, Christian; Heuser, Hans; and Radisch, Helmer, 4,540,622, Cl. 428-216.000.
Sainz, Antonio J.; and Roberts, Victor C., to National Research Development Corp. Variable characteristic filters. 4,540,946, Cl. 328-167.000.
Saito, kazuyuki: *See*—
Sasaki, Yoshio; and Saito, kazuyuki, 4,539,953, Cl. 123-90.410.
Saito, Seiji, to Canon Kabushiki Kaisha. Recording apparatus. 4,540,996, Cl. 346-140.00R.
Saito, Toru, to S. Soga & Co. Power switch assembly having a circuit breaker and a circuit disconnector. 4,541,033, Cl. 361-333.000.
Saito, Tsutomu: *See*—
Odashima, Takeshi; and Saito, Tsutomu, 4,540,860, Cl. 200-83.00C.
Saka, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Mixer circuit. 4,541,123, Cl. 455-325.000.
Sakai, Kunikazu; Tunemoto, Daiei; Kobori, Takeo; and Kondo, Kiyosi, to Lederle (Japan), Ltd. Method for preparing 5-mercapto-1,2,3-thiadiazole salts. 4,540,794, Cl. 548-127.000.
Sakaki, Masakatsu; and Hiraga, Masaharu, to Sanden Corporation. Axial sealing device for a scroll-type fluid displacement apparatus. 4,540,355, Cl. 418-55.000.
Sakakihara, Masahiko; Hasegawa, Kenzi; and Iwama, Akira, to Hitachi Metals, Ltd.; and Hitachi, Ltd. Non-magnetic substrate material. 4,540,638, Cl. 428-693.000.
Sakamoto, Hisashi: *See*—
Hidaka, Toshiyuki; Sakamoto, Hisashi; Fukuhara, Toshiaki; Fujieda, Sadao; and Misawa, Yutaka, 4,540,603, Cl. 427-82.000.
Sakamoto, Kiichiro: *See*—
Tamura, Kaoru; and Sakamoto, Kiichiro, 4,540,167, Cl. 271-11.000.
Sakao, Nobuo: *See*—
Kuraoka, Yasuo; and Sakao, Nobuo, 4,539,824, Cl. 62-380.000.
Sakatani, Takenobu; and Suzuki, Shigeru, to Lion Corporation. Fabric treating composition for addition to granular detergent. 4,540,499, Cl. 252-8.750.
Sako, Yoichiro; and Odaka, Kentaro, to Sony Corporation. Method for error correction. 4,541,092, Cl. 371-39.000.
Sakurai, Kiyomi, to Napp Systems (USA) Inc. Water developable photopolymerizable composition and printing plate element containing same. 4,540,649, Cl. 430-270.000.
Sakurai, Masao: *See*—
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, 4,539,823, Cl. 62-228.500.
Sakurai, Shigenori; Kamo, Takashi; and Furutani, Toshinobu, to Toyota Jidosha Kabushiki Kaisha. Oxygen sensor element with a ceramic heater and a method for manufacturing it. 4,540,479, Cl. 204-427.000.
Salahun, Yves: *See*—
Albouy, Pierre; Salahun, Yves; Botquin, Francois; and Cordani, Roberto, 4,540,852, Cl. 179-18.0FA.
Salerni, John V.: *See*—
Schmuck, Phillip W.; Salerni, John V.; and Wetzel, Rodney J., 4,540,051, Cl. 166-278.000.
Salomon S.A.: *See*—
Pradier, Serge, 4,539,764, Cl. 36-121.000.
SAME S.p.A.: *See*—
Bosisio, Roberto, 4,539,945, Cl. 123-41.310.
Sanden Corporation: *See*—
Sakaki, Masakatsu; and Hiraga, Masaharu, 4,540,355, Cl. 418-55.000.
Tamura, Yasuji, 4,539,821, Cl. 62-228.500.
Sanders Associates, Inc.: *See*—
Baer, Ralph H., 4,540,176, Cl. 273-148.00B.
Gunderson, Charles; and Kapadya, Aftab H., 4,540,993, Cl. 346-139.00R.
Lawrence, James, 4,540,994, Cl. 346-139.00R.
Sandler, Steven M., to Venus Scientific Inc. Magnetically modulated d-c to d-c forward converter power supply. 4,541,039, Cl. 363-21.000.
Sandoz Ltd.: *See*—
Kaul, Bansi L., 4,540,775, Cl. 534-575.000.
Veit, Werner, 4,540,525, Cl. 260-512.00C.
Sands, Bruce W.; and Nehring, Robert J., Jr., to PQ Corporation. Hollow microspheres with organosilicon-silicate walls. 4,540,629, Cl. 428-402.000.
Sanofi S.A.: *See*—
Biziere, Kathleen; Hallot, Andre ; and Kan, Jean-Paul, 4,540,696, Cl. 514-254.000.
Santrade Ltd.: *See*—
Cowdery, James R.; Park, David B.; and Khoylian, Rouzas R., 4,540,083, Cl. 198-465.100.
Larsson, Lars E., 4,540,200, Cl. 285-332.400.
Sanyo Electric Co., Ltd.: *See*—
Okuda, Takao, 4,540,866, Cl. 219-10.770.
Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
Shirakawa, Kiyoshi, 4,540,116, Cl. 229-38.000.
Sarhan, Shakir: *See*—
Seiler, Nikolaus; and Sarhan, Shakir, 4,540,582, Cl. 514-561.000.
Sarson, Gary A., to Standard Telephones and Cables, PLC. Tone generation circuit for automatic PCM-TDM telecommunication exchange. 4,541,088, Cl. 370-110.200.
Sasaki, Isamu: *See*—
Rachi, Kazuo; Kubota, Shouichi; and Sasaki, Isamu, 4,540,589, Cl. 426-250.000.
Sasaki, Kouji: *See*—
Kuwabara, Kouji; Sasaki, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,541,097, Cl. 372-87.000.
Sasaki, Masao; and Onodera, Kaoru, to Konishiroku Photo Industry Co. Ltd. Silver halide color photographic products. 4,540,658, Cl. 430-551.000.
Sasaki, Masao: *See*—
Nishizima, Toyoki; Sasaki, Masao; and Onodera, Kaoru, 4,540,656, Cl. 430-505.000.
Sasaki, Yoshio; and Saito, kazuyuki, to Toyota Jidosha Kabushiki Kaisha. Apparatus for actuating intake and exhaust valves in internal combustion engine. 4,539,953, Cl. 123-90.410.
Sasaki, Yoshio: *See*—
Nouno, Yasushi; Konishi, Masami; and Sasaki, Yoshio, 4,539,952, Cl. 123-90.360.
Sashital, Sanat K.; Joyce, Robert L.; and Gentile, Anthony L., to Hughes Aircraft Company. Silver thiogallate single crystal layers epitaxially grown from potassium chloride-silver thiogallate solution. 4,540,461, Cl. 156-624.000.
Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko; and Hosaka, Yukio, 4,540,286, Cl. 356-445.000.
Satake, Toshihiko; and Hosaka, Yukio, to Satake Engineering Co., Ltd. Apparatus for continuously measuring the degree of milling of grains. 4,540,286, Cl. 356-445.000.
Sato, Keishi: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,540,951, Cl. 330-267.000.
Sato, Masanori: *See*—
Yoneda, Tetsuzo; and Sato, Masanori, 4,539,865, Cl. 74-606.00R.
Sato, Ryoda. Net circuit type heating and warming equipment. 4,540,878, Cl. 219-545.000.
Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Method of forming color image comprising heterocyclic magenta dye-forming coupler. 4,540,654, Cl. 430-381.000.
Sato, Tadashi: *See*—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,540,704, Cl. 514-389.000.
Sautereau, Michel; Nicod, Roger; and Langlois, Pierre, to Societe Francaise Helita. Electrical ionizing devices for lightning protection. 4,540,844, Cl. 174-3.000.
Sawada, Toshiichi; Fukami, Yasuhiko; and Kinkori, Shuzo, to Nippondenso Co., Ltd. Resonator for internal combustion engines. 4,539,947, Cl. 123-52.00M.
Sawyer, Richard G.: *See*—
Cooper, John R.; and Sawyer, Richard G., 4,541,119, Cl. 455-57.000.
Sawyer, Willard H.; and Mitchell, Howard L., III, to Exxon Research and Engineering Co. Catalysts from molybdenum polysulfide precursors, their preparation and use. 4,540,481, Cl. 208-215.000.
Saxby, Michael E., to Hilvenna Limited. Cartridge assembly including pressure cylinder slidably located in casing. 4,539,969, Cl. 124-57.000.
Schadlich, Fritz: *See*—
Hornung, Friedrich; and Schadlich, Fritz, 4,540,318, Cl. 408-9.000.

Schaich, Josef. Four-stroke piston engine. 4,539,950, Cl. 123-79.00C.
Schankler, Martin. Film core with restrainer. 4,540,134, Cl. 242-74.000.
Schanne, Joseph F.; and Elliott, Lewis D., to RCA Corporation. Adaptive analog-to-digital converter. 4,540,974, Cl. 340-347.0AD.
Schanze, Rudolf. Method of producing a biologically high quality natural food concentrate, the product obtained and its use. 4,540,594, Cl. 426-74.000.
Scharf, James O.: *See*—
Himmelberger, John E.; and Scharf, James O., 4,539,739, Cl. 29-564.100.
Scharpf, Heinz: *See*—
Hagenlocher, Walter; Rapp, Lutz; Eschen, Werner; Ragaly, Istvan; Scharpf, Heinz; Streller, Jorg; Weigand, Johann; and Winkler, Klaus, 4,540,907, Cl. 310-68.00D.
Schaub, Michael M.; and Zintzmeyer, Jorg, to Zintmeyer & Lux AG. Case with an obstacle-free basic frame element, lateral elements and different types of additional elements. 4,540,071, Cl. 190-121.000.
Schaus, John M., to Eli Lilly and Company. Method of preparing trans-D1-1-alkyl-6-oxodecahydroquinolines. 4,540,787, Cl. 546-164.000.
Scheib, Thomas J.: *See*—
Klatt, John H.; and Scheib, Thomas J., 4,539,840, Cl. 73-112.000.
Scheler, Siegfried, to Hoechst Aktiengesellschaft. Two-component diazotype material with ultraviolet light-absorbing dye salt of a benzothiazole. 4,540,648, Cl. 430-172.000.
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Hubel, Egon, 4,540,934, Cl. 323-341.000.
Schering Corporation: *See*—
Afonso, Adriano; and Weinstein, Jay, 4,540,579, Cl. 514-195.000.
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Sommer, Karl; and Schickfluss, Rudolf, 4,540,816, Cl. 564-218.000.
Schievelbein, Vernon H.: *See*—
Huang, Wann-Sheng; Gassmann, Zean Z.; Hawkins, Jeffrey T.; Schievelbein, Vernon H.; and Hall, Wilbur L., 4,540,050, Cl. 166-272.000.
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Gradl, Reinhard; and Schimmel, Gunther, 4,540,557, Cl. 423-321.00R.
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Fitzer, Erich; Brennfleck, Karl; and Schlichting, Jurgen, deceased, 4,540,606, Cl. 427-247.000.
Schlossmann, Klaus: *See*—
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Schmidhammer, Ludwig; Dummer, Gerhard; Haselwarter, Klaus; and Strasser, Rudolf, to Wacker-Chemie GmbH. Process for the work-up of residues of chlorination. 4,540,837, Cl. 570-211.000.
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Curr, Thomas R.; and Schmidt, Ingrid E., 4,540,433, Cl. 75-10.00R.
Schmidt, Paul J.; and Hung, William M., to Hilton-Davis Chemical Co., The. Certain 4-substituted-2,6-bis(heteroaryl)pyridines. 4,540,790, Cl. 546-283.000.
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Gochermann, Hans; Schmidt, Wilfried; Rasch, Klaus-Dieter; and Tentscher, Karl-Heinz, 4,540,843, Cl. 136-251.000.
Schmitt, Paul, to Haut Fourneau et Fonderies de Cousances aux Forgers, S.A. Vessel for cooking food with cooling lid. 4,539,899, Cl. 99-347.000.
Schmuck, Phillip W.; Salerni, John V.; and Wetzel, Rodney J., to Baker International Corporation. One trip perforating and gravel pack system. 4,540,051, Cl. 166-278.000.
Schneider, Paul E., Sr. Therapeutic support means. 4,539,977, Cl. 128-68.000.
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Schoon, David J., to Minnesota Mining and Manufacturing Company. Data clocking circuitry for a scanning apparatus. 4,541,061, Cl. 364-518.000.
Schramm, Matthias: *See*—
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,540,789, Cl. 546-274.000.
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Schreiber, William L.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,540,812, Cl. 560-256.000.
Schroeder, Thaddeus; and Ryan, William P., to General Motors Corporation. Method of determining engine cylinder compression pressure and power output. 4,539,841, Cl. 73-116.000.
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Orser, Cindy; Loper, Joyce; Panopoulos, Nickolas; Lindow, Steven; and Schroth, Milton N., 4,540,667, Cl. 435-172.300.
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Schundehutte, Karl H.: *See*—
Henk, Hermann; Kramer, Erich; Schundehutte, Karl H.; and Nickel, Horst, 4,540,776, Cl. 534-635.000.
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Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., to Eaton Corporation. Bidirectional power FET with substrate-referenced shield. 4,541,001, Cl. 357-23.400.
Schuurman, Pieter J., to Shell Oil Company. Moving bed reactor. 4,540,547, Cl. 422-49.000.
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Schwartz, Bertram: *See*—
Anthony, Philip J.; Hartman, Robert L.; Koszi, Louis A.; and Schwartz, Bertram, 4,539,743, Cl. 29-576.00B.
Schwerdt, Friedrich: *See*—
Mueller, Harald; and Schwerdt, Friedrich, 4,540,464, Cl. 156-639.000.
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Swiatosz, Edmund; Grimmer, Paul D.; and Sciascia, Rocco M., 4,539,986, Cl. 128-205.130.
SCM Corporation: *See*—
Bonsack, James P.; and Fridman, Semyon D., 4,540,551, Cl. 423-77.000.
Borovicka, David A., Sr., 4,540,735, Cl. 524-512.000.
Scovill Inc.: *See*—
Todhunter, Gordon R.; and Grim, James W., 4,539,928, Cl. 116-34.00R.
Scrantom, DeHart G.; and Shealey, E. David, to AVX Corporation. Inserter device for electronic components. 4,539,740, Cl. 29-564.100.
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Rhyner, Edison L., 4,540,612, Cl. 428-35.000.
Seco/Warwick Corporation: *See*—
Ross, Robert H.; and Larko, Robert C., 4,540,363, Cl. 432-148.000.
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Gangemi, Giovanni; and Sefusatti, Giuseppe, 4,540,890, Cl. 307-40.000.
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Segawa, Makoto: *See*—
Ariizumi, Shoji; and Segawa, Makoto, 4,541,006, Cl. 357-41.000.
Seiden, Myron A.: *See*—
Blakely, Linda L.; and Seiden, Myron A., 4,540,259, Cl. 354-109.000.
Seiko Instruments & Electronics Ltd.: *See*—
Takahashi, Kunihiro; and Matsuyama, Nobuyoshi, 4,540,909, Cl. 310-370.000.
Yokosuka, Koichi, 4,539,736, Cl. 24-644.000.
Seiler, Nikolaus; and Sarhan, Shakir, to Merrell Dow Pharmaceuticals Inc. Treatment of seizure disorders and pharmaceutical compositions useful therein. 4,540,582, Cl. 514-561.000.
Seiver, Robert L.; and Chianelli, Russell R., to Exxon Research and Engineering Co. Supported carbon-containing molybdenum and tungsten sulfide catalysts, their preparation and use. 4,540,482, Cl. 208-215.000.
Sekibata, Masao: *See*—
Otsuka, Kanji; Mitsusada, Kazumichi; Sekibata, Masao; and Ohnishi, Shinji, 4,541,003, Cl. 357-74.000.
Sekiguchi, Kazuya: *See*—
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Sekiguchi, Shoichi: *See*—
Takafuji, Hideo; and Sekiguchi, Shoichi, 4,539,848, Cl. 73-599.000.
Sekino, Teruyoshi: *See*—
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Semiconductor Research Foundation: *See*—
Nishizawa, Jun-ichi, 4,540,466, Cl. 156-643.000.
Senda, Kenichi; Ando, Masao; Nakamura, Kyoichi; and Nishida, Tatehiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Pre-expanded particle of polyolefine and process for preparing the same. 4,540,718, Cl. 521-58.000.

Senoo, Toshihiko: *See*—
Nishi, Kazuro; Kurahashi, Koichiro; Hashimoto, Tsutomu; Senoo, Toshihiko; and Yamato, Shinji, 4,540,247, Cl. 350-3.710.
Sequoia Systems, Inc.: *See*—
Stiffler, Jack J.; Budwey, Michael J.; and Nolan, James M., Jr., 4,541,094, Cl. 371-68.000.
Serbent, Harry: *See*—
Hirsch, Martin; Fischer, Peter; and Serbent, Harry, 4,540,432, Cl. 75-43.000.
Serizawa, Hajime: *See*—
Harada, Susumu; Shimizu, Kiyoshi; and Serizawa, Hajime, 4,540,760, Cl. 526-211.000.
Serono Pharmaceutical Partners: *See*—
Wood, Grace; Duce, Benjamin R.; Pelham, Russell W.; and Woiszwillo, James, 4,540,410, Cl. 604-56.000.
Servas, Vladimiros, and Voors, Wilhelm P. H., to South African Inventions Development Corp. Asphalt recycling. 4,540,287, Cl. 366-7.000.
Sestak, Joseph T.; and Coon, Dennis C., to American Sterilizer Company. Temperature sensitive reclosure indicator. 4,539,929, Cl. 116-221.000.
Seth, Pyare, to Mepha AG. Gel-like ointment containing indometacin. 4,540,572, Cl. 424-81.000.
Seto, Susumu, to Canon Kabushiki Kaisha. Image detecting device. 4,540,250, Cl. 350-438.000.
Seufert, Wolf D.; and Cote, Roger A. Apparatus and method of line pattern analysis. 4,541,113, Cl. 382-4.000.
Seuter, Friedel: *See*—
Mardin, Mithat; Busse, Wolf-Dieter; Hoffmeister, Friedrich; Seuter, Friedel; Perzborn, Elisabeth; Schlossmann, Klaus; Mayer, Dieter; and Fiedler, Volker, 4,540,707, Cl. 514-404.000.
Seyberlich, Alfred: *See*—
Behre, Horst; Blank, Heinz U.; Seyberlich, Alfred; and Hagedorn, Ferdinand, 4,540,817, Cl. 564-218.000.
Seyuin, Kenneth J.: *See*—
Bennett, Jack L.; Wardynski, Wayne E.; and Seyuin, Kenneth J., 4,540,384, Cl. 464-111.000.
Shade, Edwin J., Jr. Workpiece holder. 4,540,164, Cl. 269-88.000.
Shafer, Ronald E.: *See*—
Molloy, Edward W.; and Shafer, Ronald E., 4,540,381, Cl. 464-29.000.
Shaffer, Jacob E., Jr.; and Picarello, Joseph F., to Borg-Warner Corporation. Control system for electric water heater with heat pump external heat source. 4,540,874, Cl. 219-279.000.
Shambroom, John R.; and Sliski, Alan P., to Control Data Corporation. Calibration apparatus for capacitance height gauges. 4,539,835, Cl. 73-1.00J.
Shape, Inc.: *See*—
Gelardi, Paul J.; and MacLeod, Robert B., Jr., 4,540,090, Cl. 206-387.000.
Sharp Kabushiki Kaisha: *See*—
Imanaka, Yoshiaki; and Kinashi, Hiroshi, 4,540,270, Cl. 355-3.00R.
Itoh, Masataka; and Katoh, Shohichi, 4,541,015, Cl. 358-212.000.
Kanou, Ikuo; Yanagiuchi, Shigenobu; and Omori, Takuro, 4,541,069, Cl. 364-900.000.
Morita, Akitaka; and Nittaya, Hiroshi, 4,540,180, Cl. 273-313.000.
Nishiyama, Haruo, 4,540,269, Cl. 355-3.00R.
Ogura, Mitsuru, 4,539,906, Cl. 101-93.140.
Sharpe, Jewett M. Endoscopic surgical instrument. 4,539,976, Cl. 128-6.000.
Shavit, Amos: *See*—
Gorney, Moshe; Lerner, Michael; and Shavit, Amos, 4,540,125, Cl. 239-232.000.
Shealey, E. David: *See*—
Scrantom, DeHart G.; and Shealey, E. David, 4,539,740, Cl. 29-564.100.
Shell Oil Company: *See*—
Olson, Donald C., 4,540,561, Cl. 423-573.00R.
Schuurman, Pieter J., 4,540,547, Cl. 422-49.000.
Vinegar, Harold J.; and Wellington, Scott L., 4,540,882, Cl. 250-255.000.
Shelton, L. Harvey. Three-wheeled scooter-type vehicle. 4,540,192, Cl. 280-282.000.
Sherwood, Charles H., to Hughes Aircraft Company. Flexible air permeable non-woven fabric filters. 4,540,625, Cl. 428-283.000.
Sherwood Medical Company: *See*—
Bodicky, Raymond O., 4,540,411, Cl. 604-169.000.
Sherwood, Richard C.: *See*—
Boredelon, Chester M.; Chin, Gilbert Y.; Jin, Sungho; Sherwood, Richard C.; and Wernick, Jack H., 4,540,453, Cl. 148-31.550.
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, to Nissan Motor Co., Ltd. Vehicle steering system. 4,540,059, Cl. 180-141.000.
Shibata, Setsuo; Koshiba, Yukihiko; Hamamoto, Yoshito; Kugai, Katsutoshi; Kawashima, Akiro; and Fujisawa, Hiroshi, to JGC Corporation. Apparatus for filtration of a suspension. 4,540,490, Cl. 210-323.200.
Shibata, Takehiko, to Canon Kabushiki Kaisha. Loop transmission with back-up power supply for the interface. 4,541,044, Cl. 364-200.000.
Shibuya, Masanobu: *See*—
Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, 4,539,808, Cl. 57-411.000.
Shibuya, Yoshimichi; Takahashi, Masami; and Ishibashi, Tadashi, to Hitachi, Ltd. Liquid crystal display element. 4,540,242, Cl. 350-335.000.
Shideler, Ronald: *See*—
Landa, Isaac J.; and Shideler, Ronald, 4,540,282, Cl. 356-328.000.
Shigemura, Yutaka: *See*—
Irie, Yoichiro; Shigemura, Yutaka; and Namba, Satoshi, 4,540,279, Cl. 355-69.000.
Shim, Peter B. S. Bi-directional feed dog mechanism for sewing machine. 4,539,925, Cl. 112-314.000.
Shimada, Hiroshi, to Fujitsu Limited. Protective device for a semiconductor integrated circuit including double polysilicon resistor. 4,541,002, Cl. 357-51.000.
Shimada, Yoshio: *See*—
Moteki, Murato; Shimada, Yoshio; Tanaka, Fumihiro; Watanabe, Fumio; and Komatsu, Kazuyuki, 4,540,992, Cl. 346-76.0PH.
Shimadzu Corporation: *See*—
Akiyama, Osamu, 4,540,281, Cl. 356-325.000.
Shimazaki, Masahiro, to Mitsuboshi Belting Ltd. Ultrasonic working apparatus. 4,540,113, Cl. 228-1.100.
Shimizu, Isamu: *See*—
Oshima, Noboru; Shimizu, Isamu; and Yoshimura, Yoshito, 4,540,744, Cl. 525-332.900.
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Harada, Susumu; Shimizu, Kiyoshi; and Serizawa, Hajime, 4,540,760, Cl. 526-211.000.
Shimizu, Tsuguo: *See*—
Wada, Kenichi; Shintani, Yooichi; Shimizu, Tsuguo; and Yamaoka, Akira, 4,541,047, Cl. 364-200.000.
Shimizu, Yoshio; and Yokoya, Satoshi, to Sony Corporation. Pilot signal detecting circuit for AM stereo signals. 4,541,109, Cl. 381-15.000.
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Shin-Ichiro, Kobayashi: *See*—
Imai, Kazuhiro; Zenzo, Tamura; and Shin-Ichiro, Kobayashi, 4,540,548, Cl. 422-52.000.
Shindow, Osamu: *See*—
Hoshika, Shuji; Ishiai, Hideyuki; Nishikawa, Yukiyasu; Hara, Masato; Aiura, Hirochika; Okamoto, Ikuzo; and Shindow, Osamu, 4,540,253, Cl. 351-211.000.
Shinkai, Kouki; Hagiwara, Naoki; and Nakano, Masaki, to Hitachi, Ltd. Fluorescent lamp and phosphor coating composition used therefor. 4,540,915, Cl. 313-486.000.
Shinoda, Noboru: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Shinoda, Noboru; Isono, Tetsusaburo; and Fujiwara, Kenji, 4,540,674, Cl. 501-97.000.
Shinohara, Koichi: *See*—
Suzuki, Takashi; Hibino, Kunio; Murai, Mikio; Kawase, Shigeki; and Shinohara, Koichi, 4,540,618, Cl. 428-141.000.
Shintani, Yooichi: *See*—
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Shiota, Katsuyuki; Tanaka, Kunihiko; and Minai, Masayoshi, to Sumitomo Chemical Company, Limited. Method for producing 2-cyclopentenones. 4,540,825, Cl. 568-341.000.
Shiragasawa, Tsuyoshi, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory device. 4,541,090, Cl. 371-21.000.
Shirakawa, Kiyoshi, to Sanyo-Kokusaku Pulp Co., Ltd. Bottom flap structure in paper box for liquids. 4,540,116, Cl. 229-38.000.
Shirakura, Toshiharu: *See*—
Kuwabara, Kouji; Sasaki, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,541,097, Cl. 372-87.000.
Shirasaka, Masaru: *See*—
Hagiwara, Hiroshi; Shirasaka, Masaru; and Nagayama, Hajime, 4,540,553, Cl. 423-230.000.
Shirley, Gaylord R.; and Chiodo, Daniel J., to Packaging Corporation International. Disposable automatic lancet. 4,539,988, Cl. 128-314.000.
Shor, Joel T.: *See*—
Carey, A. Andrew; and Shor, Joel T., 4,540,503, Cl. 252-78.300.
Shores, Marvin W., to General Dynamics Pomona Division. Dielectric heat sensor. 4,540,293, Cl. 374-130.000.
Short, William T.; Ottaviani, Robert A.; and Hart, Donald J., to General Motors Corporation. Sag control of high solid polyurethane clearcoats by urea thixotrope/acrylic microgel systems. 4,540,734, Cl. 524-507.000.
Shrum, William E.: *See*—
Im, Jang-hi; and Shrum, William E., 4,540,623, Cl. 428-220.000.
Shyu, Shiang C. Drawing implement. 4,539,757, Cl. 33-177.000.
Sidhu, Pawitter S.; and Delgado, Gary M. Control rod for clutch actuator for floppy disk drive. 4,541,025, Cl. 360-99.000.
Sidin, Philippe: *See*—
Potage, Jean; and Sidin, Philippe, 4,541,101, Cl. 375-28.000.
Sieb, Lawrence E.: *See*—
Belanger, Barry F.; and Sieb, Lawrence E., 4,541,106, Cl. 378-099.000.
Sieben, Joannes H. F. C., to U.S. Philips Corporation. Magnetic-tape guide arrangement for a cassette and a magnetic-tape cassette apparatus. 4,541,024, Cl. 360-85.000.
Siedband, Melvin P., to Wisconsin Alumni Research Foundation. Plywheel-powered mobile X-ray apparatus. 4,540,930, Cl. 322-4.000.
Sielfeld, Gilbert, to Chemische Werke Huels AG. Polymerization of vinyl chloride in the presence of a catalyst solubilized prior to exposure to monomer. 4,540,759, Cl. 526-200.000.
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Bettge, Hans; Bialkowski, Gunther; and Hoene, Ernst-Ludwig, 4,540,863, Cl. 200-144.00B.
Esterl, Robert; and Weiser, Josef, 4,540,963, Cl. 335-133.000.

Feigt, Ingmar; and Wersing, Wolfram, 4,541,017, Cl. 358-295.000.
Grallert, Hans-Joachim, 4,540,973, Cl. 340-347.0DD.
Grallert, Hans-Joachim, 4,541,102, Cl. 375-30.000.
Jahrig, Siegfried; and Opitz, Wolfgang, 4,540,862, Cl. 200-144.00B.
Kolzer, Walter; and Reischer, Wilhelm, 4,540,926, Cl. 318-609.000.
Leibenzeder, Siegfried; and Weyrich, Claus, 4,540,451, Cl. 148-173.000.
Plies, Erich; Weyl, Reinhard; and Lischke, Burkhard, 4,540,885, Cl. 250-310.000.
Winzer, Gerhard, 4,540,237, Cl. 350-96.150.
Ziegler, Horst, 4,539,850, Cl. 73-706.000.

Siler, G. Daniel, to Dayton Machine Tool Company. Apparatus for rotating a generally cylindrical heavy workpiece for treatment. 4,540,872, Cl. 219-159.000.

Silver Lake Corporation: *See—*
Buttolph, John L., III, 4,540,875, Cl. 219-364.000.

Simer, Loren J.: *See—*
Steiner, Charles W.; and Simer, Loren J., 4,540,342, Cl. 417-40.000.

Simer Pump Company: *See—*
Steiner, Charles W.; and Simer, Loren J., 4,540,342, Cl. 417-40.000.

Simington, Jack F., to Simington Products Co. Saw chain sharpener. 4,539,871, Cl. 76-42.000.

Simington Products Co.: *See—*
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Simmonds, Robert C., Jr.; Gilbride, Andrew J.; and Morse, Albert L., to USM Corporation. Method of applying a fusible powder. 4,540,608, Cl. 427-282.000.

Simpson, Howard D.; Richardson, Ryden L.; and Angmorter, Paul K., to Union Oil Company of California. Hydrotreating process. 4,540,483, Cl. 208-216.0PP.

Sincerbox, Glenn T., to International Business Machines Corporation. Opto-optical light deflector/modulator. 4,540,244, Cl. 350-354.000.

Sinclair, Robert I.: *See—*
Petcen, Donald H.; and Sinclair, Robert I., 4,540,532, Cl. 264-1.100.

Sirasaki, Yuichi: *See—*
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,540,942, Cl. 324-326.000.

Sirkis, Nahemia, to Detonics Small Arms, Ltd. Handgun of the revolver type. 4,539,771, Cl. 42-64.000.

Siuta, Vincent P., to Du Pont de Nemours, E. I., and Company. Thick film conductor compositions. 4,540,604, Cl. 427-96.000.

SKW Trostberg AG: *See—*
Wolfsgruber, Friedrich; Weiser, Ernst A.; Gmohling, Werner; Kern, Hans; and Reifferscheid, Karl J., 4,540,436, Cl. 75-130.00A.

Sladky, Hans H. Flow-control system with pressure-responsive valve. 4,540,016, Cl. 137-244.000.

Slagle, Frederick A. Training method for putting golf balls. 4,540,179, Cl. 273-186.00C.

Sliski, Alan P.: *See—*
Shambroom, John R.; and Sliski, Alan P., 4,539,835, Cl. 73-1.00J.

Slushnene, Iolita R.: *See—*
Chuiko, Alexei A.; Morev, Anatoly V.; Golovkov, Alexandr S.; Smirnov, Valentin A.; Voronin, Evgeny F.; Evlakhova, Raisa A.; Guba, Galina Y.; Slushnene, Iolita R.; Pasvyanskas, Arunas V.; and Sushko, Roman V., 4,540,652, Cl. 430-84.000.

Smirnov, Valentin A.: *See—*
Chuiko, Alexei A.; Morev, Anatoly V.; Golovkov, Alexandr S.; Smirnov, Valentin A.; Voronin, Evgeny F.; Evlakhova, Raisa A.; Guba, Galina Y.; Slushnene, Iolita R.; Pasvyanskas, Arunas V.; and Sushko, Roman V., 4,540,652, Cl. 430-84.000.

Smith, Alfred M.: *See—*
Zanavich, James K.; and Smith, Alfred M., 4,540,160, Cl. 256-19.000.

Smith, Arnold R., to AT&T Bell Laboratories. Cable terminal pedestal. 4,540,846, Cl. 174-38.000.

Smith, Gregory L. Cable release mechanism. 4,540,210, Cl. 294-82.340.

Smith International, Inc.: *See—*
Baugh, Benton F.; Henderson, Herman O., Jr.; and Fowler, John H., 4,540,053, Cl. 166-348.000.
Furley, Richard G.; and Fowler, John H., 4,540,013, Cl. 137-75.000.
Nimmagadda, Rao R., 4,540,596, Cl. 427-37.000.

Smith-Johannsen, Robert, to Ramu International. Cross-country ski sole. 4,540,195, Cl. 280-610.000.

Smith, John R. E., to Dresser Industries, Inc. Electroacoustic transducer. 4,541,081, Cl. 367-168.000.

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Brown, Thomas H.; and Rawlings, Derek A., 4,540,699, Cl. 514-272.000.

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Lloyd, Ronald, 4,540,408, Cl. 604-294.000.

Smith, Norman A., to Ciba-Geigy AG. Substituted hydroquinones. 4,540,785, Cl. 546-116.000.

Smith, Patrick E.: *See—*
Roquemore, Glenn R.; Smith, Patrick E.; and Banks, Eric W., 4,540,315, Cl. 405-264.000.

Smith, Roger L.: *See—*
Bolenbaugh, Daniel L.; and Smith, Roger L., 4,540,069, Cl. 188-218.00A.

Smith, Terence W.: *See—*
Hardy, George W.; Lowe, Lawrence A.; and Smith, Terence W., 4,540,682, Cl. 514-18.000.

Smith, Timothy J. C.; Geke, Jurgen; and Cooper, Robert Q., to Amchem Products, Inc. Compositions and methods for removing sealant compositions. 4,540,442, Cl. 134-2.000.

Smith, William R., to Aluminum Company of America. Apparatus for cleaning furnace walls. 4,539,725, Cl. 15-93.00A.

SmithKline Beckman Corporation: *See—*
Wert, Kathleen L.; and Tremper, Alan W., 4,540,819, Cl. 564-340.000.

Smock, Alan L.: *See—*
Gresley, Ross A.; Leech, Howard E.; and Smock, Alan L., 4,540,962, Cl. 335-131.000.

SO.M.A. Europe Transmission-Societe Nouvelle Mecanique et Automobile: *See—*
Rogier, Leonce, 4,540,073, Cl. 192-4.00A.

Societa' Cavi Pirelli S.p.A.: *See—*
Priaroggia, Paolo G., 4,540,889, Cl. 307-2.000.

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Meynier, Guy, 4,540,067, Cl. 188-71.500.

Societe Anonyme de Telecommunications: *See—*
Levy, Pierre; and Robert, Andre , 4,540,139, Cl. 244-3.190.
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Sautereau, Michel; Nicod, Roger; and Langlois, Pierre, 4,540,844, Cl. 174-3.000.

Societe Nationale des Poudres et Explosifs: *See—*
Chevallier, Sammy, 4,540,770, Cl. 528-248.000.

Societe Nationale Elf Aquitaine: *See—*
Gautier, Jean C.; and Kamornicki, Jacques, 4,540,448, Cl. 148-6.15R.

Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux: *See—*
Brice, Jean-Michel; and Maillart, Patrick, 4,541,073, Cl. 365-156.000.

Soderberg, Paul B., to Soderberg Research & Development, Inc. Oil-well pump system and method. 4,540,348, Cl. 417-383.000.

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Soltau, John P. Fuel flow measuring system for an internal combustion engine powered vehicle. 4,539,965, Cl. 123-514.000.

Someya, Nobuo. Composition for promotion of health. 4,540,584, Cl. 424-156.000.

Sommer, Karl; and Schickfluss, Rudolf, to Hoechst Aktiengesellschaft. Single-vessel process for preparing ring-substituted n-alkylanilines. 4,540,816, Cl. 564-218.000.

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Pointner, Martin; and Sommer, Rudiger, 4,540,151, Cl. 249-93.000.

Sommers, Walter M.: *See—*
Logan, Emanual L., Jr.; Sommers, Walter M.; and Walsh, J. William, 4,540,208, Cl. 292-341.190.

Sony Corporation: *See—*
Furuya, Tsuneo; and Hori, Katsuya, 4,541,093, Cl. 371-40.000.
Ishikawa, Fumio, 4,540,902, Cl. 307-352.000.
Kariya, Izumi; and Eguchi, Yzsuhito, 4,540,991, Cl. 346-76.0PH.
Katsuyama, Akira, 4,541,022, Cl. 360-72.200.
Ochi, Shigeyuki; and Yamanaka, Seisuke, 4,541,016, Cl. 358-228.000.
Sako, Yoichiro; and Odaka, Kentaro, 4,541,092, Cl. 371-39.000.
Shimizu, Yoshio; and Yokoya, Satoshi, 4,541,109, Cl. 381-15.000.
Watanabe, Nobuhiko, 4,541,089, Cl. 371-8.000.

South African Inventions Development Corp.: *See—*
Servas, Vladimiros; and Voors, Wilhelm P. H., 4,540,287, Cl. 366-7.000.

Southco, Inc.: *See—*
Frame, William R.; and Vickers, James H., 4,540,206, Cl. 292-66.000.

Southworth, Peter R.; and Baxter, Gregory R., to Nacom Industries, Inc. Semiconductor wafer transport system. 4,540,326, Cl. 414-217.000.

Speca, Anthony N., to National Distillers and Chemical Corporation. Intermetallic compounds of polymeric transition metal oxide alkoxides and catalytic use thereof. 4,540,680, Cl. 502-119.000.

Spengler, Walter, to Electronova S.A. Printing unit with an electrostatic printing aid comprising electrodes contained in a lid structure. 4,539,908, Cl. 101-426.000.

Speranza, George P.; Cuscurida, Michael; and Dominguez, Richard J. G., to Texaco Inc. Rim elastomers made from terephthalate polyester polyol derived polymer polyols. 4,540,768, Cl. 528-79.000.

Speranzin, Claudio: *See—*
Bertoli, Luciano; Badiali, Roberto; and Speranzin, Claudio, 4,539,802, Cl. 57-22.000.

Sperry Corporation: *See—*
McLean, Kenneth W., 4,539,797, Cl. 56-12.300.
Osselaere, Guy H. J., 4,540,003, Cl. 130-27.00T.
Steele, Thomas S., 4,540,228, Cl. 339-74.00R.

Spivack, John D.; Pastor, Stephen D.; and Odorisio, Paul, to Ciba-Geigy Corporation. Alkylated S-(hydroxyphenylthio) alkanoates. 4,540,732, Cl. 524-289.000.

Spouse, Keith G.: *See—*
Cutler, David S.; and Spouse, Keith G., 4,540,920, Cl. 318-7.000.

Sprague Electric Company: *See—*
Ross, Sidney D.; and Finkelstein, Manuel, 4,541,037, Cl. 361-433.000.

Spraying Systems Co.: *See—*
Haruch, James, 4,540,124, Cl. 239-223.000.

Squire, Edward N., to Du Pont de Nemours, E. I., and Company. Oligomers of prefluoro(2,2-dimethyl-1,3-dioxole) and their fluorination products. 4,540,799, Cl. 549-448.000.

Stach, Leonard J.: *See—*
Nickell, Louis G.; Stach, Leonard J.; and Luteri, George F., 4,540,431, Cl. 71-107.000.
Stafford, George C.; Kelley, Paul E.; and Stephens, David R., to Finnigan Corporation. Method of mass analyzing a sample by use of a quadrupole ion trap. 4,540,884, Cl. 250-282.000.
Staggs, Michael J.; and Starnes, Gary D. Refrigerant recovery and charging device. 4,539,817, Cl. 62-149.000.
Stahle, Martin. Open-type centrifugal pump with single-blade impeller. 4,540,334, Cl. 415-72.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Fiber feed arrangement. 4,539,806, Cl. 57-400.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Open end friction spinning apparatus. 4,539,807, Cl. 57-401.000.
Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,539,806, Cl. 57-400.000.
Stahlecker, Fritz, 4,539,807, Cl. 57-401.000.
Staller, Kerry P., to Procter & Gamble Company, The. Method of providing odor to product container. 4,540,721, Cl. 523-102.000.
Stamicarbon B.V., Licensing Subsidiary of DSM: *See—*
van Geenen, Albert A.; Bongers, Joseph J. M.; van der Loos, Jozef L. M.; and Vrinssen, Cornelis H., 4,540,515, Cl. 260-239.30R.
van Geenen, Albert A.; Bongers, Joseph J. M.; and van der Loos, Jozef L. M., 4,540,516, Cl. 260-239.30R.
Stamps, Kenneth H.: *See—*
Bishop, Charles D.; Stamps, Kenneth H.; and Turney, David L., 4,539,898, Cl. 99-336.000.
Standard Oil Company, The: *See—*
Hardman, Harley F.; and Beach, Ronald I., 4,540,713, Cl. 518-713.000.
Wu, Muyen M.; and Ball, Lawrence E., 4,540,498, Cl. 252-8.55D.
Standard Oil Company (Indiana): *See—*
Fields, Ellis K., 4,540,527, Cl. 260-949.000.
Standard Telephones and Cables, PLC: *See—*
Sarson, Gary A., 4,541,088, Cl. 370-110.200.
Standardgraph Zeichengerate GmbH: *See—*
Gigli, Giuseppe, 4,540,303, Cl. 401-258.000.
Stanescu, Mircea S.: *See—*
Kurie, John R.; and Stanescu, Mircea S., 4,540,362, Cl. 432-65.000.
Stanley, Richard L.; and Henry, George R., to United States of America, Air Force. Fuel pump vent drain system. 4,539,809, Cl. 60-39.094.
Stanner, Donald; and Hughes, Walton, to General Motors Corporation. Cut out device. 4,540,331, Cl. 414-730.000.
Stanton, David J., to Medtronic, Inc. Fail-safe muscle stimulator device. 4,539,993, Cl. 128-421.000.
Stark, Reimund: *See—*
Hassel, Helmut; and Stark, Reimund, 4,539,912, Cl. 105-8.00R.
Starkstrom Gummersbach GmbH: *See—*
Lemmer, Helmut, 4,540,859, Cl. 200-6.00B.
Starnes, Gary D.: *See—*
Staggs, Michael J.; and Starnes, Gary D., 4,539,817, Cl. 62-149.000.
Stauffer Chemical Company: *See—*
Hsu, Joanna K.; and Gutman, Arnold D., 4,540,429, Cl. 71-90.000.
Uhing, Eugene H., 4,540,526, Cl. 260-936.000.
Wehrenberg, Peter K., 4,540,804, Cl. 560-060.000.
Stearns & Foster Company, The: *See—*
Gilmore, Thomas F.; and Ratliff, Hershel E., 4,540,616, Cl. 428-131.000.
Steele, Thomas S., to Sperry Corporation. Low insertion force connector with improved cam actuator. 4,540,228, Cl. 339-74.00R.
Steigerwald, Robert L.: *See—*
Park, John N.; and Steigerwald, Robert L., 4,541,041, Cl. 363-41.000.
Stein, Helmut, to Robert Bosch GmbH. Process for making electrical connections between two surfaces of a printed circuit board. 4,539,747, Cl. 29-846.000.
Steiner, Charles W.; and Simer, Loren J., to Simer Pump Company. Hydraulic switch. 4,540,342, Cl. 417-40.000.
Stenkvist, Sven-Einar: *See—*
Rappinger, Bo; and Stenkvist, Sven-Einar, 4,541,099, Cl. 373-72.000.
Stephan, Hans-Werner: *See—*
Gradl, Reinhard; Stephan, Hans-Werner; Heymer, Gero; and Schimmel, Gunther, 4,540,558, Cl. 423-321.00R.
Stephan, John T.: *See—*
Stephan, Kurt F.; and Stephan, John T., 4,540,820, Cl. 564-38.000.
Stephan, Kurt F.; and Stephan, John T., to Moorman Manufacturing Company. Production of animal feed grade biuret. 4,540,820, Cl. 564-38.000.
Stephens, David R.: *See—*
Stafford, George C.; Kelley, Paul E.; and Stephens, David R., 4,540,884, Cl. 250-282.000.
Sterling Drug Inc.: *See—*
Bailey, Denis M., 4,540,705, Cl. 514-401.000.
Stetter, Jorg: *See—*
Forster, Heinz; Diehr, Hans-Joachim; Stetter, Jorg; Eue, Ludwig; and Schmidt, Robert R., 4,540,430, Cl. 71-90.000.
Stevens, Charles E.: *See—*
Dale, Lawrence A.; Grenleski, Stephen E., Jr.; Keirsey, James L.; and Stevens, Charles E., 4,539,811, Cl. 60-270.100.
Stevens, Frederick G.; Heideman, Robert J.; and Holden, Jerry B., to Hydra Systems International, Inc. Mount for attaching a device to a firearm. 4,539,769, Cl. 42-1.00A.
Stevens, George L., to Morton Thiokol, Inc. Igniter pellet cup. 4,539,910, Cl. 202-349.000.
Stevenson, Robert L. Sawmill. 4,539,877, Cl. 83-731.000.
Stewart, Iain G. H.; and Pitz, Hans P., to Maschinenfabrik Fr. Niepmann GmbH & Co. Device for joining the payed-out end of a strip, which has been wound into a reel, with the beginning of the strip of another reel. 4,540,459, Cl. 156-504.000.
Stiffler, Jack J.; Budwey, Michael J.; and Nolan, James M., Jr., to Sequoia Systems, Inc. Self-checking computer circuitry. 4,541,094, Cl. 371-68.000.
Stivala, Oscar G. Sutureless closure system. 4,539,990, Cl. 128-335.000.
Stobb, Inc.: *See—*
Stobb, Walter J., 4,540,168, Cl. 271-101.000.
Stobb, Walter J., to Stobb, Inc. Method and apparatus for removing sheets from a stack. 4,540,168, Cl. 271-101.000.
Stoltefuss, Jurgen; Franckowiak, Gerhard; Boshagen, Horst; Goldmann, Siegfried; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, to Bayer Aktiengesellschaft. 3-Nitro-5-amide-1,4-dihydropyridines with positive inotropic activity. 4,540,684, Cl. 514-32.000.
Stone, Mark L.: *See—*
Johnson, Timothy W.; and Stone, Mark L., 4,540,620, Cl. 428-195.000.
Storage Technology Corporation: *See—*
Bowers, Stephen G.; Trueblood, Tim B.; and Cabiedes, Anthony, 4,541,076, Cl. 365-190.000.
Storage Technology Partners: *See—*
Cooke, Laurence H.; Feretich, Robert A.; and Boyle, Richard F., 4,540,903, Cl. 307-465.000.
Strasser, Rudolf: *See—*
Schmidhammer, Ludwig; Dummer, Gerhard; Haselwarter, Klaus; and Strasser, Rudolf, 4,540,837, Cl. 570-211.000.
Streicher, Manfred. Stricture pump. 4,540,350, Cl. 417-475.000.
Streller, Jorg: *See—*
Hagenlocher, Walter; Rapp, Lutz; Eschen, Werner; Ragaly, Istvan; Scharpf, Heinz; Streller, Jorg; Weigand, Johann; and Winkler, Klaus, 4,540,907, Cl. 310-68.00D.
Stuck, Earl N.; and Zackay, Victor F., to Teledyne Industries, Inc. Casting and coating with metallic particles. 4,539,930, Cl. 118-300.000.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
Lenz, Werner, 4,540,044, Cl. 165-149.000.
Suerken, Hans-Peter: *See—*
Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; van der Maas, Hendrikus; and Suerken, Hans-Peter, 4,540,777, Cl. 536-102.000.
Suetomo, Shigeru: *See—*
Azuma, Noriharu; and Suetomo, Shigeru, 4,540,480, Cl. 208-44.000.
Sueyoshi, Susumu: *See—*
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,540,951, Cl. 330-267.000.
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, to Nissan Motor Co., Ltd. Lock-up control system for lock-up type automatic transmission. 4,539,869, Cl. 74-866.000.
Sugalski, Raymond K., to General Electric Company. Means for presenting an electrode of a rechargeable electrochemical cell to a winding arbor. 4,539,746, Cl. 29-730.000.
Sugama, Toshifumi; Kukacka, Lawrence E.; and Horn, William H., to United States of America, Energy. Electropositive bivalent metallic ion unsaturated polyester complexed polymer concrete. 4,540,726, Cl. 523-505.000.
Sugano, Hiroshi: *See—*
Yamaguchi, Nobuyuki; and Sugano, Hiroshi, 4,540,335, Cl. 415-129.000.
Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Hydraulic control system for automatic transmission. 4,539,870, Cl. 74-869.000.
Sugar, Joseph, to Hughes Aircraft Company. Surface-metalized, bonded fuse with mechanically-stabilized end caps. 4,540,969, Cl. 337-232.000.
Sugawara, Hiroyuki: *See—*
Kuwabara, Kouji; Sasaki, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,541,097, Cl. 372-87.000.
Sugihara, Kunihiko: *See—*
Yoneda, Kenji; and Sugihara, Kunihiko, 4,540,126, Cl. 239-533.400.
Sugimoto, Kenichi: *See—*
Yamaguchi, Keizaburo; Sugimoto, Kenichi; Tanabe, Yoshimitsu; Kawashima, Saburo; and Yamaguchi, Akihiro, 4,540,818, Cl. 564-330.000.
Sugimoto, Tadao: *See—*
Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, 4,540,655, Cl. 430-410.000.
Sugisaki, Mutuo: *See—*
Tanaka, Hiroshi; Sugisaki, Mutuo; and Itoh, Kazuhiro, 4,539,895, Cl. 92-249.000.
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, to House Food Industrial Company Limited. Filling apparatus. 4,539,903, Cl. 99-470.000.
Sugiura, Yasuyuki: *See—*
Mizunoya, Nobuyuki; Kohama, Hajime; and Sugiura, Yasuyuki, 4,540,462, Cl. 156-630.000.
Suhrbier, Rolf: *See—*
Vick, Walter; and Suhrbier, Rolf, 4,539,904, Cl. 99-618.000.
Suk, Laddie E.: *See—*
Herr, Diane E.; Suk, Laddie E.; and Winchell, David F., 4,540,850, Cl. 179-2.0DP.
Sulc, Josef M. Dental attachment structure. 4,540,367, Cl. 433-181.000.

Sulzer Morat GmbH: *See—*
Leins, Eberhard; and Walter, Manfred, 4,539,826, Cl. 66-64.000.

Sumitomo Chemical Co., Ltd.: *See—*
Ishizumi, Kikuo; Ohashi, Naohito; and Muramatsu, Michihisa, 4,540,695, Cl. 514-239.000.
Konishi, Hiroyuki; Hino, Naganori; Matsumoto, Hiroshi; and Yoshida, Ryo, 4,540,824, Cl. 568-45.000.
Otake, Katsumasa; Omura, Takashi; Kayane, Yutaka; and Imada, -Kunihiko, 4,540,418, Cl. 8-524.000.
Saegusa, Takeo; Kobayashi, Shiro; and Moriuchi, Yasuhiro, 4,540,747, Cl. 525-410.000.
Shiota, Katsuyuki; Tanaka, Kunihiko; and Minai, Masayoshi, 4,540,825, Cl. 568-341.000.

Sumitomo Electric Industries, Ltd.: *See—*
Nagasaki, Shoji; Kojima, Keiichi; and Ueno, Keiji, 4,540,597, Cl. 427-44.000.

Sunbeam Plastics Corporation: *See—*
Luker, Edward, 4,540,098, Cl. 215-216.000.

Sundquist, Mark L., to National Electrostatics Corporation. Vibration isolator for cryopump. 4,539,822, Cl. 62-55.500.

Sundstrand Data Control, Inc.: *See—*
Lee, Charles K.; Peters, Rex B.; and Gogic, Aleksandar M., 4,541,105, Cl. 377-19.000.

Surace, Filippo: *See—*
Garcea, Giampaolo; and Surace, Filippo, 4,539,944, Cl. 123-41.060.

Sushko, Roman V.: *See—*
Chuiko, Alexei A.; Morev, Anatoly V.; Golovkov, Alexandr S.; Smirnov, Valentin A.; Voronin, Evgeny F.; Evlakhova, Raisa A.; Guba, Galina Y.; Slushnene, Iolita R.; Pasvyanskas, Arunas V.; and Sushko, Roman V., 4,540,652, Cl. 430-84.000.

Sutherland, George K.: *See—*
Zelinka, Richard J.; Sutherland, George K.; and Thielen, Thomas J., 4,540,877, Cl. 219-497.000.

Sutt, Robert F., Jr., to Calgon Carbon Corporation. Carbon molecular sieves and a process for their preparation and use. 4,540,678, Cl. 502-5.000.

Sutton, Steven R.; Hagen, Michael S.; Chapman, David D.; Gombert, Glenn S.; and Palmquist, Steven R., to Tektronix, Inc. Apparatus including a programmable set-up and hold feature. 4,541,100, Cl. 375-10.000.

Suzuki, Hayao, to Kabushiki Kaisha Daini Seikosha. System for positioning an object at a predetermined point for a digital servo device. 4,540,924, Cl. 318-568.000.

Suzuki, Hiroshi, to Tachikawa Spring Co., Ltd. Headrest device for a vehicle seat. 4,540,217, Cl. 297-391.000.

Suzuki, Motoyuki: *See—*
Oku, Masuo; Yamashita, Masami; Miura, Yoshio; and Suzuki, Motoyuki, 4,541,084, Cl. 369-45.000.

Suzuki, Nobuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Image-sensing charge-coupled device with both high-speed and low-speed read-outs. 4,540,901, Cl. 307-311.000.

Suzuki, Shigeru: *See—*
Sakatani, Takenobu; and Suzuki, Shigeru, 4,540,499, Cl. 252-8.750.

Suzuki, Shizuo: *See—*
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,540,942, Cl. 324-326.000.

Suzuki, Shoji; and Ishiwata, Ichiro, to Nippon Air Brake Co., Ltd. Brake holder. 4,540,072, Cl. 192-4.00A.

Suzuki, Tadashi: *See—*
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,539,869, Cl. 74-866.000.

Suzuki, Takashi; Hibino, Kunio; Murai, Mikio; Kawase, Shigeki; and Shinohara, Koichi, to Matsushita Electric Industrial Co., Ltd. Magnetic recording medium. 4,540,618, Cl. 428-141.000.

Suzuki, Yasuo: *See—*
Ohnishi, Haruo; Kosuzume, Hiroshi; Suzuki, Yasuo; and Mochida, Ei, 4,540,569, Cl. 424-94.000.

Swan Corporation, The: *See—*
Moore, John W., 4,539,721, Cl. 4-613.000.

Swanson, Dennis E.; and Lerum, Robert D. Apparatus for applying liquid coatings. 4,540,301, Cl. 401-146.000.

Swartzbaugh, Peter T.; and Hehl, Edward M., to Owens-Illinois, Inc. Tamper indicating package. 4,540,099, Cl. 215-252.000.

Swearingen, Ralph M. Lock system for removable automobile roof panel. 4,540,215, Cl. 296-218.000.

Swedlow, Inc.: *See—*
Ashlock, Lysander T.; Mukamal, Harold; and White, William H., 4,540,634, Cl. 428-451.000.

Sweetappie, Gary G.: *See—*
Covitch, Michael J.; and Sweetapple, Gary G., 4,540,716, Cl. 521-28.000.

Swerdloff, Michael D.: *See—*
Van Der Puy, Michael; Hendrickson, Larry L.; Kolc, Jaroslav F.; Rogic, Milorad M.; and Swerdloff, Michael D., 4,540,428, Cl. 71-28.000.

Swetnam, Larry D.; Casada, James H.; and Walton, Linus R., to University of Kentucky Research Foundation. Cultivating attachment for crop harvester support vehicle. 4,540,054, Cl. 172-292.000.

Swiatosz, Edmund; Grimmer, Paul D.; and Sciascia, Rocco M., to United States of America, Navy. Simulated oxygen breathing apparatus. 4,539,986, Cl. 128-205.130.

Swiss Aluminium Ltd.: *See—*
Roggen, Rolf, 4,540,434, Cl. 75-93.00R.

Swisstronic (Proprietary) Limited: *See—*
Zibung, Rene A., 4,540,232, Cl. 339-198.00G.

Synektron Corporation: *See—*
Blom, Hans A., 4,540,906, Cl. 310-67.00R.

Sys-Tec, Inc.: *See—*
Zelinka, Richard J.; Sutherland, George K.; and Thielen, Thomas J., 4,540,877, Cl. 219-497.000.

Syva Company: *See—*
Litman, David J.; and Ullman, Edwin F., 4,540,659, Cl. 435-7.000.

Szabo, Laszlo, to International Standard Electric Corporation. Transmitter-receiver module. 4,541,120, Cl. 455-86.000.

Szala, Lawrence E.: *See—*
Lee, Minyoung; Reed, William R., Jr.; and Szala, Lawrence E., 4,539,875, Cl. 82-1.00C.

Szlam, Aleksander; and Quinn, Chester P., to Melita Electronic Labs, Inc. Detecting signals within a passband on a telephone line. 4,540,855, Cl. 179-84.00R.

Szmuszkovicz, Jacob, to Upjohn Company, The. 2-(Phenylmethylene)-cycloalkylamines and -azetidines. 4,540,690, Cl. 514-210.000.

Tachibana, Tamotsu, to Tomy Kogyo Company, Incorporated. Articulated toy capable of retracting driving wheels upon articulation. 4,540,379, Cl. 446-448.000.

Tachikawa Spring Co., Ltd.: *See—*
Suzuki, Hiroshi, 4,540,217, Cl. 297-391.000.

Taguchi, Masao: *See—*
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,539,903, Cl. 99-470.000.

Taguchi, Minoru: *See—*
Kanzaki, Koichi; and Taguchi, Minoru, 4,539,742, Cl. 29-576.00W.

Tahara, Hiroshi: *See—*
Kakuhashi, Takeshi; Tahara, Hiroshi; and Mori, Yoshihisa, 4,540,463, Cl. 156-630.000.

Tahara, Susumu: *See—*
Inaba, Yukio; Igarashi, Taisei; Tahara, Susumu; and Miyatake, Takashi, 4,540,800, Cl. 549-462.000.

Taig, Alistair G., to Allied Corporation. Centering device for a constant velocity joint. 4,540,383, Cl. 464-110.000.

Taillens, Jean-Francois; and Lechner, Heinz, to 3S S.A. Surveillance apparatus. 4,540,977, Cl. 340-552.000.

Takafuji, Hideo; and Sekiguchi, Shoichi, to Nippon Steel Corporation. Method of determining grain size using ultrasonic waves. 4,539,848, Cl. 73-599.000.

Takagi, Masashi: *See—*
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, 4,539,823, Cl. 62-228.500.

Takagi, Shigeru: *See—*
Tomita, Masahiro; and Takagi, Shigeru, 4,540,535, Cl. 264-44.000.

Takagi, Shoyo: *See—*
Kobashi, Toshiyuki; and Takagi, Shoyo, 4,540,754, Cl. 526-88.000.

Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, to Fuji Photo Film Co., Ltd. Method of processing a direct positive silver halide photographic light-sensitive material. 4,540,655, Cl. 430-410.000.

Takahashi, Kenji: *See—*
Honda, Nobuyasu; Matsui, Toshikazu; Fushida, Akira; Ikeda, Toshimitsu; Takahashi, Kenji; Fukuda, Hideo; Kamezaki, Yasushi; and Teshima, Takashi, 4,540,645, Cl. 430-122.000.

Takahashi, Kotei, to Nissan Motor Company, Ltd. Shift control mechanism of an automotive manual transmission. 4,539,858, Cl. 74-475.000.

Takahashi, Kunihiro; and Matsuyama, Nobuyoshi, to Seiko Instruments & Electronics Ltd. Tuning fork type quartz crystal resonator with variable width base. 4,540,909, Cl. 310-370.000.

Takahashi, Kunio; Oda, Noriyuki; Kido, Nobuyuki; and Muramatsu, Keizi, to Asahi Glass Company, Ltd. Sand-filled sealing structure between at least one tube and a tube support plate. 4,540,184, Cl. 277-12.000.

Takahashi, Masami: *See—*
Shibuya, Yoshimichi; Takahashi, Masami; and Ishibashi, Tadashi, 4,540,242, Cl. 350-335.000.

Takahashi, Takashi: *See—*
Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; Furukawa, Osamu; Endo, Hiroshi; Hirao, Osamu; and Hayashi, Masaru, 4,540,971, Cl. 338-21.000.

Takahashi, Yuichiro. Composition for improving strength of soft ground containing organic matter, and method of improving strength of soft ground by utilizing said composition. 4,540,316, Cl. 405-264.000.

Takahata, Naomi: *See—*
Masuda, Shunichi; Furuichi, Katsushi; and Takahata, Naomi, 4,540,170, Cl. 271-259.000.

Takamatsu Electric Works, Ltd.: *See—*
Kato, Kazuaki; and Washizu, Tomio, 4,540,968, Cl. 337-31.000.

Takamura, Kozo: *See—*
Kondo, Ryoji; Takamura, Kozo; and Higuchi, Kanji, 4,540,910, Cl. 313-11.500.

Takao, Hisashi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Sulfenyl carbamate derivatives and insecticidal compositions containing the same. 4,540,708, Cl. 514-469.000.

Takaoka, Akio: *See—*
Ishikawa, Nobuo; and Takaoka, Akio, 4,540,524, Cl. 260-465.400.

Takaoka, Saburo; Naito, Ryuichi; Yokogawa, Fumihiko; and Ogawa, Youichi, to Pioneer Electronic Corporation. Digital modulation signal reading device. 4,540,897, Cl. 307-268.000.

Takasago, Masahiro: *See—*
Maeda, Takeshi; Uno, Motoo; and Takasago, Masahiro, 4,541,083, Cl. 369-44.000.

Takasaka, Yuko; and Tsujino, Takuichi, to Freund Industry Company, Limited. Process for the preparation of activated pharmaceutical compositions. 4,540,602, Cl. 427-213.310.

Takashima, Susumu; Kanke, Takao; Inagaki, Naoki; and Fukushima, Kazumasa, to Casio Computer Co. Ltd. LSP Voice synthesizer. 4,541,111, Cl. 381-51.000.

Takayama, Suguru: *See*—
Kobayashi, Koji; Noguchi, Kiyoshi; and Takayama, Suguru, 4,540,600, Cl. 427-130.000.

Takeda Chemical Industries, Ltd.: *See*—
Tanida, Seiichi; Muroi, Masayuki; and Hasegawa, Toru, 4,540,517, Cl. 260-239.30B.

Takeda, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Device having thyristors connected in series. 4,540,895, Cl. 307-252.00Q.

Takeda, Yukio; Ogihara, Satoru; Ura, Mitsuru; Nakamura, Kousuke; Asai, Tadamichi; Ohkoshi, Tokio; Matsushita, Yasuo; and Maeda, Kunihiro, to Hitachi, Ltd. Sintered aluminum nitride and semi-conductor device using the same. 4,540,673, Cl. 501-96.000.

Takei, Yoshiaki: *See*—
Fujimaki, Yoshihide; Takei, Yoshiaki; and Nomori, Hiroyuki, 4,540,651, Cl. 430-72.000.

Takemori, Satoshi: *See*—
Kuwabara, Kouji; Sasaki, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,541,097, Cl. 372-87.000.

Takeuchi, Tatuo: *See*—
Ishizawa, Akio; Hukaya, Toshio; Kumagai, Katuya; and Takeuchi, Tatuo, 4,540,627, Cl. 428-328.000.

Takeuchi, Yoshimitsu: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Shinoda, Noboru; Isono, Tetsusaburo; and Fujiwara, Kenji, 4,540,674, Cl. 501-97.000.

Takeya, Yasushi: *See*—
Okumura, Mitsuhiro; Naya, Eizo; Yorita, Mitsumasa; and Takeya, Yasushi, 4,540,861, Cl. 200-144.00B.

Takimoto, Koichi: *See*—
Ueda, Ikuo; Morino, Daizo; and Takimoto, Koichi, 4,540,701, Cl. 514-357.000.

TAM Ceramics: *See*—
Chu, Mike S. H.; Hodgkins, Charles E.; and Rose, Daniel C., 4,540,676, Cl. 501-138.000.

Tamefelt Oy AB: *See*—
Lundstrom, Kristian V., 4,540,469, Cl. 162-199.000.

Tamura, Kaoru; and Sakamoto, Kiichiro, to Fuji Photo Film Co., Ltd. Apparatus for mounting a recording medium. 4,540,167, Cl. 271-11.000.

Tamura, Takashi, to Konishiroku Photo Industry Co., Ltd. Apparatus for driving optical system for exposure of a copying machine. 4,540,273, Cl. 355-8.000.

Tamura, Yasuji, to Sanden Corporation. Capacity control device for controlling a variable displacement compressor in an air conditioning system. 4,539,821, Cl. 62-228.500.

Tanabe, Yoshimitsu: *See*—
Yamaguchi, Keizaburo; Sugimoto, Kenichi; Tanabe, Yoshimitsu; Kawashima, Saburo; and Yamaguchi, Akihiro, 4,540,818, Cl. 564-330.000.

Tanaka, Fumihiro: *See*—
Moteki, Murato; Shimada, Yoshio; Tanaka, Fumihiro; Watanabe, Fumio; and Komatsu, Kazuyuki, 4,540,992, Cl. 346-76.0PH.

Tanaka, Hiroshi; Sugisaki, Mutuo; and Itoh, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Sealing device. 4,539,895, Cl. 92-249.000.

Tanaka, Kenji, to Pioneer Electronic Corporation. Disc clamping mechanism. 4,541,086, Cl. 369-271.000.

Tanaka, Kunihiko: *See*—
Shiota, Katsuyuki; Tanaka, Kunihiko; and Minai, Masayoshi, 4,540,825, Cl. 568-341.000.

Tanaka, Norio, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for motorized cycles. 4,540,189, Cl. 280-270.000.

Tanaka, Satoru: *See*—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,540,704, Cl. 514-389.000.

Tanaka, Tatsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Variable resistance circuit. 4,540,896, Cl. 307-264.000.

Tanida, Seiichi; Muroi, Masayuki; and Hasegawa, Toru, to Takeda Chemical Industries, Ltd. Antibiotic TAN-420. 4,540,517, Cl. 260-239.30B.

Taniguchi, Nobuyuki: *See*—
Matsumoto, Toshiaki; and Taniguchi, Nobuyuki, 4,540,261, Cl. 354-173.110.
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,540,262, Cl. 354-195.130.

Tanimoto, Iwao: *See*—
Kako, Hiroyoshi; Kobayashi, Nobuo; Tanimoto, Iwao; and Aiba, Shigeo, 4,539,857, Cl. 74-422.000.

Tanimoto, Yasufumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Two speed step motor driving apparatus for copying machines. 4,540,927, Cl. 318-696.000.

Taplin, John F. Supply control valve with integral pressure limiter. 4,540,020, Cl. 137-596.150.

Taskinen, Pekka M.: *See*—
Jarvinen, Erkki J.; Taskinen, Pekka M.; Pullo, Jarmo J.; Kinnunen, Seppo T.; and Andersson, Arvo E., 4,540,290, Cl. 366-286.000.

Tatsumi, Iazuaki: *See*—
Kada, Hironosuke; Sekino, Teruyoshi; Murayama, Hirogazu; Tatsumi, Iazuaki; and Murakami, Tsudoi, 4,541,062, Cl. 364-513.000.

Taylor, James H. Ski rope handle assembly. 4,540,371, Cl. 441-69.000.

Taylor, William L., to Knickerbocker Company, The. Load rotating attachment for lift trucks. 4,540,330, Cl. 414-641.000.

TDK Corporation: *See*—
Kobayashi, Koji; Noguchi, Kiyoshi; and Takayama, Suguru, 4,540,600, Cl. 427-130.000.

Teagan, William P., to Arthur D. Little, Inc. Integral storage solar heating system. 4,539,975, Cl. 126-439.000.

Teche, Andre : *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,540,797, Cl. 549-302.000.

Tecle, Haile: *See*—
Downs, David A.; and Tecle, Haile, 4,540,780, Cl. 544-129.000.

Teerman, Richard F., to General Motors Corporation. Electromagnetic unit fuel injector with pivotable armature. 4,540,122, Cl. 239-88.000.

Teikoku Sen-I Co., Ltd.: *See*—
Kawanishi, Toshio; and Hareyama, Satoshi, 4,540,617, Cl. 428-137.000.

Tekron Licensing B.V.: *See*—
Evans, Harold R., 4,540,172, Cl. 272-133.000.

Tektronix, Inc.: *See*—
Biggs, Lawrence G.; and Radochonski, Pierre, 4,540,997, Cl. 346-140.00R.
Bruce, Robert A., 4,540,938, Cl. 324-121.00R.
Jalovec, Lee J., 4,540,982, Cl. 340-743.000.
Sutton, Steven R.; Hagen, Michael S.; Chapman, David D.; Gombert, Glenn S.; and Palmquist, Steven R., 4,541,100, Cl. 375-10.000.

Teledyne Industries: *See*—
Rezy, Bernard J., 4,539,812, Cl. 60-304.000.

Teledyne Industries, Inc.: *See*—
Kaufmann, William A., 4,540,870, Cl. 219-126.000.
Stuck, Earl N.; and Zackay, Victor F., 4,539,930, Cl. 118-300.000.

TELEFUNKEN electronic GmbH: *See*—
Colquhoun, Alexander; and Kohn, Erhard, 4,541,000, Cl. 357-15.000.
Gochermann, Hans; Schmidt, Wilfried; Rasch, Klaus-Dieter; and Tentscher, Karl-Heinz, 4,540,843, Cl. 136-251.000.

Teleky, Walter. Security lock box with removable key plug. 4,539,828, Cl. 70-369.000.

Tellis, Cyril: *See*—
Ream, Bernard C.; and Tellis, Cyril, 4,540,552, Cl. 423-226.000.

Temple, Davis L., Jr.: *See*—
Nair, Xina; and Temple, Davis L., Jr., 4,540,581, Cl. 514-415.000.

Tentscher, Karl-Heinz: *See*—
Gochermann, Hans; Schmidt, Wilfried; Rasch, Klaus-Dieter; and Tentscher, Karl-Heinz, 4,540,843, Cl. 136-251.000.

Terada, Yasuo: *See*—
Tomita, Takao; Tottori, Takumi; Terada, Yasuo; Toyota, Hideki; and Akiba, Masahiro, 4,539,813, Cl. 60-314.000.

Terasawa, Hideo: *See*—
Kikuta, Makoto; and Terasawa, Hideo, 4,539,931, Cl. 118-404.000.

Ternes, Mark P.; and Kedl, Robert J., to United States of America, Energy. Gas hydrate cool storage system. 4,540,501, Cl. 252-70.000.

Terry, Reese S., Jr.: *See*—
Calfee, Richard V.; Bertasz, Robert N.; Terry, Reese S., Jr.; Gordon, Pat L.; and Baker, Ross G., Jr., 4,539,992, Cl. 128-419.0PG.

Tescher, Andrew G., to Compression Labs, Inc. Video bandwidth reduction system employing interframe block differencing and transform domain coding. 4,541,012, Cl. 358-133.000.

Teshima, Takashi: *See*—
Honda, Nobuyasu; Matsui, Toshikazu; Fushida, Akira; Ikeda, Toshimitsu; Takahashi, Kenji; Fukuda, Hideo; Kamezaki, Yasushi; and Teshima, Takashi, 4,540,645, Cl. 430-122.000.

Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,540,797, Cl. 549-302.000.

Tessler, Martin M.; Dirscherl, Teresa A.; and Wurzburg, Otto B., to National Starch and Chemical Corporation. Sulfosuccinate, alkyl- and alkenyl sulfosuccinate, sulfomaleate, and disulfosuccinate half-esters of polygalactomannans. 4,540,778, Cl. 536-114.000.

Teuling, Dirk J. A., to U.S. Philips Corporation. Circuit for simultaneous cut-off of two series connected high voltage power switches. 4,540,933, Cl. 323-271.000.

Teutsch, Jean G.: *See*—
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 4,540,686, Cl. 514-179.000.

Texaco Development Corporation: *See*—
Knifton, John F., 4,540,810, Cl. 560-226.000.

Texaco Inc.: *See*—
Hawkins, Jeffrey T.; and Gassmann, Zean Z., 4,540,049, Cl. 166-272.000.
Huang, Wann-Sheng; Gassmann, Zean Z.; Hawkins, Jeffrey T.; Schievelbein, Vernon H.; and Hall, Wilbur L., 4,540,050, Cl. 166-272.000.
Larkin, John M.; Yeakey, Ernest L.; and Watts, Lewis W., Jr., 4,540,821, Cl. 564-473.000.
Paap, Hans J., 4,539,847, Cl. 73-579.000.
Speranza, George P.; Cuscurida, Michael; and Dominguez, Richard J. G., 4,540,768, Cl. 528-79.000.
Vanderpool, Steven H., 4,540,822, Cl. 564-479.000.

Texas Instruments Incorporated: *See*—
Thompson, Raymond W.; Kalidas, Navinchandra; Abbott, John H.; and Laffitte, David S., 4,540,226, Cl. 339-17.0CF.

Textron, Inc.: *See*—
Kucera, Helmut W.; and Saad, Samy K., 4,540,633, Cl. 428-423.100.

Theeuwes, Felix, to Alza Corporation. Parenteral dispensing system with programmable drug administration. 4,540,403, Cl. 604-85.000.

Theobald, Paul R.: *See*—
Hunter, William L.; and Theobald, Paul R., 4,541,005, Cl. 357-81.000.
Theysohn, Rainer: *See*—
Pipper, Gunter; Schmidt, Franz; Theysohn, Rainer; Riegger, Siegfried; Heil, Eduard; Fischer, Hermann; Thoma, Richard; and Matthies, Paul, 4,540,772, Cl. 528-335.000.
Thielen, Thomas J.: *See*—
Zelinka, Richard J.; Sutherland, George K.; and Thielen, Thomas J., 4,540,877, Cl. 219-497.000.
Thigpen, Ben B., to Western Geophysical Company of America. Marine streamer cable recovery system. 4,541,079, Cl. 367-19.000.
Thoma, Richard: *See*—
Pipper, Gunter; Schmidt, Franz; Theysohn, Rainer; Riegger, Siegfried; Heil, Eduard; Fischer, Hermann; Thoma, Richard; and Matthies, Paul, 4,540,772, Cl. 528-335.000.
Thomas, Alfonso. Air heating and filtering apparatus. 4,539,896, Cl. 98-1.000.
Thomas, Gunter: *See*—
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,540,789, Cl. 546-274.000.
Stoltefuss, Jurgen; Franckowiak, Gerhard; Boshagen, Horst; Goldmann, Siegfried; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,540,684, Cl. 514-32.000.
Thomas, Rudy V., to Allied Corporation. Safety belt system for childs chair. 4,540,218, Cl. 297-467.000.
Thomas, Tommy; and West, John W., to Canada Cup, Inc. Injection blow molding process and apparatus. 4,540,543, Cl. 264-526.000.
Thompson, Raymond W.; Kalidas, Navinchandra; Abbott, John H.; and Laffitte, David S., to Texas Instruments Incorporated. Intelligent electronic connection socket. 4,540,226, Cl. 339-17.0CF.
Thomson-CSF: *See*—
Ballegeer, Jean C.; and Nguyen, Duyet H., 4,541,043, Cl. 364-200.000.
Blum, Guy, 4,541,121, Cl. 455-103.000.
Croset, Michel; Dieumegard, Dominique; and Pribat, Didier, 4,540,452, Cl. 148-175.000.
Lacour, Clement F.; and Latouche, Yannick, 4,541,124, Cl. 455-327.000.
Potage, Jean; and Sidin, Philippe, 4,541,101, Cl. 375-28.000.
Rougeolle, Daniel; and Porrot, Pascal, 4,541,009, Cl. 358-13.000.
Thoratec Laboratories Corporation: *See*—
Miles, Clive, 4,540,406, Cl. 604-269.000.
Thorne, William D., to International Business Machines Corporation. Bar band intersectional matrix printer. 4,540,296, Cl. 400-121.000.
Thorschmidt, Donald, to Acebee Manufacturing Co., a part interest. Method and apparatus for forming notches for gussets for expandable envelopes. 4,540,390, Cl. 493-23.000.
Thoseby, Michael R.: *See*—
Dobinson, Bryan; and Thoseby, Michael R., 4,540,769, Cl. 528-90.000.
Timofeev, Dmitry A.: *See*—
Musin, Rafail M.; Gryaznov, Mikhail I.; Timofeev, Dmitry A.; Filatov, Nikolai Y.; and Andreeva, Tamara S., 4,541,070, Cl. 364-900.000.
Tittert, Curt, to Braun Aktiengesellschaft. Temperature controlled fuel gas throughflow valve. 4,539,974, Cl. 126-409.000.
Tobias, Michael A.: *See*—
Lynch, Conrad L.; and Tobias, Michael A., 4,540,751, Cl. 525-517.500.
Todhunter, Gordon R.; and Grim, James W., to Scovill Inc. Tire equalizer and indicator. 4,539,928, Cl. 116-34.00R.
Toepel, Richard R., to General Motors Corporation. Two-cycle diesel engine and method for methanol and like fuel operation. 4,539,948, Cl. 123-65.0BA.
Togari, Hisashi; and Miyata, Shinji, to Nippon Electric Company, Ltd. Gain control circuit for obtaining a constant output signal amplitude by attenuating an input signal amplitude. 4,540,953, Cl. 330-284.000.
Togino, Takayoshi, to Olympus Optical Co., Ltd. Objective lens system for microscopes. 4,540,248, Cl. 350-414.000.
Tokai Electric Wire Company Limited: *See*—
Saijo, Eiji; and Wakata, Shigekazu, 4,540,233, Cl. 339-258.00R.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Andow, Fumio; Yamaura, Mitsuru; and Kondow, Ryotaro, 4,541,058, Cl. 364-483.000.
Ariizumi, Shoji; and Segawa, Makoto, 4,541,006, Cl. 357-41.000.
Kamohara, Eiji, 4,540,374, Cl. 445-37.000.
Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; Furukawa, Osamu; Endo, Hiroshi; Hirao, Osamu; and Hayashi, Masaru, 4,540,971, Cl. 338-21.000.
Kanzaki, Koichi; and Taguchi, Minoru, 4,539,742, Cl. 29-576.00W.
Kondo, Hirofumi, 4,540,545, Cl. 376-364.000.
Miyano, Toshiyuki; and Ohmura, Hideo, 4,539,789, Cl. 53-131.000.
Mizunoya, Nobuyuki; Kohama, Hajime; and Sugiura, Yasuyuki, 4,540,462, Cl. 156-630.000.
Omori, Shozo, 4,540,614, Cl. 428-57.000.
Suzuki, Nobuo, 4,540,901, Cl. 307-311.000.
Tanaka, Tatsuo, 4,540,896, Cl. 307-264.000.
Tanimoto, Yasufumi, 4,540,927, Cl. 318-696.000.
Yamanaka, Junichi; and Kusaka, Masataka, 4,540,918, Cl. 315-371.000.
Tomioka, Toshikazu: *See*—
Nukina, Yasuyuki; Namikawa, Syunji; Tomioka, Toshikazu; Yamamoto, Takehiko; and Oi, Susumu, 4,540,666, Cl. 435-167.000.
Tomita, Haruo; and Yonezawa, Kazuya, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Epoxy resin and process for preparing the same. 4,540,802, Cl. 549-557.000.
Tomita, Masahiro; and Takagi, Shigeru, to Nippon Soken, Inc. Method for producing a ceramic filter for cleaning exhaust gases from a diesel engine. 4,540,535, Cl. 264-44.000.
Tomita, Takao; Tottori, Takumi; Terada, Yasuo; Toyota, Hideki; and Akiba, Masahiro, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust system control apparatus in an internal combustion engine. 4,539,813, Cl. 60-314.000.
Tomizuka, Katsushige: *See*—
Ukai, Norio; and Tomizuka, Katsushige, 4,539,805, Cl. 57-290.000.
Tomono, Kiyohisa: *See*—
Nakajima, Toyohei; and Tomono, Kiyohisa, 4,539,967, Cl. 123-585.000.
Tomy Kogyo Company, Incorporated: *See*—
Tachibana, Tamotsu, 4,540,379, Cl. 446-448.000.
Tooyama, Hiroshi: *See*—
Horikoshi, Tatsuo; Yonezawa, Seiji; Tsuyoshi, Toshiaki; Tooyama, Hiroshi; and Otake, Masatoshi, 4,541,082, Cl. 369-44.000.
Torii, Michihiro; Kosaka, Tomoyoshi; Maeda, Takeo; and Rikukawa, Hiroshi, to Fuji Electrochemical Co., Ltd. Low temperature sinterable oxide magnetic material. 4,540,500, Cl. 252-62.580.
Torii, Shunichi: *See*—
Nagashima, Shigeo; Torii, Shunichi; Omoda, Koichiro; and Inagami, Yasuhiro, 4,541,046, Cl. 364-200.000.
Torrini, Franco, to Torrini G. S.p.A. Button-cover. 4,539,731, Cl. 24-92.000.
Torrini G. S.p.A.: *See*—
Torrini, Franco, 4,539,731, Cl. 24-92.000.
Toscano, Luciano; and Cappelletti, Leonard M., to Pierrel S.p.A. Semisynthetic macrolidic antibiotics, intermediate compounds for their preparation and related pharmaceutical compositions containing compounds for their preparation and related pharmaceutical compositions containing them. 4,540,662, Cl. 435-74.000.
Toshiba Corporation: *See*—
Abuyama, Yasuo, 4,540,274, Cl. 355-14.0FU.
Fukatsu, Kunio, 4,540,106, Cl. 221-13.000.
Toshihiko, Fukuhara, to Kabushiki Kaisha Komatsu Seisakusho. Stress distribution measuring instrument. 4,541,059, Cl. 364-508.000.
Tottori, Takumi: *See*—
Tomita, Takao; Tottori, Takumi; Terada, Yasuo; Toyota, Hideki; and Akiba, Masahiro, 4,539,813, Cl. 60-314.000.
Tower, John R., to RCA Corporation. Reducing noise in introducing bias charge into charge transfer devices. 4,541,068, Cl. 364-825.000.
Toyo Polymer Co., Ltd.: *See*—
Midorikawa, Yoshio, 4,540,300, Cl. 401-107.000.
Toyoda Gosei Co., Ltd.: *See*—
Kasugai, Joji; and Nakagami, Akihiro, 4,540,103, Cl. 220-203.000.
Toyono, Tsutomu; and Onoda, Shigeyoshi, to Canon Kabushiki Kaisha. Process kit and image forming apparatus using such kit. 4,540,268, Cl. 355-3.00R.
Toyota, Hideki: *See*—
Tomita, Takao; Tottori, Takumi; Terada, Yasuo; Toyota, Hideki; and Akiba, Masahiro, 4,539,813, Cl. 60-314.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, 4,539,859, Cl. 74-475.000.
Habu, Nobuo, 4,539,868, Cl. 74-864.000.
Ito, Toshimitsu; and Kobayashi, Nobuyuki, 4,539,958, Cl. 123-440.000.
Kako, Hiroyoshi; Kobayashi, Nobuo; Tanimoto, Iwao; and Aiba, Shigeo, 4,539,857, Cl. 74-422.000.
Kobayashi, Hideo; Kashiwagi, Takao; Yoshimura, Kunimasa; and Mae, Hisao, 4,539,942, Cl. 123-41.100.
Nouno, Yasushi; Konishi, Masami; and Sasaki, Yoshio, 4,539,952, Cl. 123-90.360.
Sakurai, Shigenori; Kamo, Takashi; and Furutani, Toshinobu, 4,540,479, Cl. 204-427.000.
Sasaki, Yoshio; and Saito, kazuyuki, 4,539,953, Cl. 123-90.410.
Watanabe, Atsushi, 4,539,810, Cl. 60-39.161.
Yoneda, Tetsuzo; and Sato, Masanori, 4,539,865, Cl. 74-606.00R.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Gomi, Koichi; and Nishio, Shigeru, 4,540,153, Cl. 251-11.000.
Trager, Seymour F.; and Chylinski, Victoria S. Injectionable viscoelastic ophthalmic gel. 4,540,568, Cl. 424-81.000.
TRANSCODAN, Sven Husted-Andersen GmbH & Co. KG: *See*—
Forberg, Hans J., 4,540,027, Cl. 137-848.000.
Transformatoren Union Aktiengesellschaft: *See*—
Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; and Pfeiffer, Richard, 4,540,536, Cl. 264-102.000.
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Wignall, Robert A.; and Travale, Samuel, 4,540,530, Cl. 261-92.000.
Tremblay, Phillip G. L.: *See*—
Jarvi, Reino E.; and Tremblay, Phillip G. L., 4,539,750, Cl. 30-300.000.
Tremblay, Richard P.: *See*—
Owoc, James R.; and Tremblay, Richard P., 4,540,019, Cl. 137-557.000.
Tremper, Alan W.: *See*—
Wert, Kathleen L.; and Tremper, Alan W., 4,540,819, Cl. 564-340.000.
Tri-Saver Corporation: *See*—
Guell, Mario R., 4,539,966, Cl. 123-557.000.

Trueblood, Tim B.: *See*—
Bowers, Stephen G.; Trueblood, Tim B.; and Cabiedes, Anthony, 4,541,076, Cl. 365-190.000.
Tsao, Kuey-Yeou, to Gould, Inc. Selective LPCVD tungsten deposition by the silicon reduction method. 4,540,607, Cl. 427-253.000.
Tsubakimoto Chain Co.: *See*—
Ohyama, Akira, 4,541,029, Cl. 361-31.000.
Tsuchikawa, Shunzo; and Kawabata, Yasuhiro, to Aisin Seiki Kabushiki Kaisha. Engine cooling system. 4,539,943, Cl. 123-41.050.
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Kawamura, Kazunori; Yamashita, Shinichi; Yokoyama, Yuichi; and Tsuchiya, Makoto, 4,540,761, Cl. 526-245.000.
Tsuchiya, Tadashi: *See*—
Kawasaki, Takao; Tsuchiya, Tadashi; and Osaka, Yoshiakf, 4,540,702, Cl. 514-369.000.
Tsugeno, Makoto: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; Hatanaka, Masataka; Hirose, Masayoshi; and Kudo, Masaki, 4,540,706, Cl. 514-403.000.
Tsujino, Takuichi: *See*—
Takasaka, Yuko; and Tsujino, Takuichi, 4,540,602, Cl. 427-213.310.
Tsukada, Kiyotaka: *See*—
Enomoto, Ryo; and Tsukada, Kiyotaka, 4,540,677, Cl. 501-151.000.
Tsukai, Michiharu: *See*—
Michiharu, Tsukai, 4,540,319, Cl. 408-100.000.
Tsutsui, Kyoji, to Ricoh Co., Ltd. Tetrazonium salt compounds, novel disazo compounds, method for the production thereof and disazo compound-containing electrophotographic elements. 4,540,643, Cl. 430-58.000.
Tsuyoshi, Toshiaki: *See*—
Horikoshi, Tatsuo; Yonezawa, Seiji; Tsuyoshi, Toshiaki; Tooyama, Hiroshi; and Otake, Masatoshi, 4,541,082, Cl. 369-44.000.
Tucker, Charles R.: *See*—
Garst, Roger H.; Tuller, Frank N.; and Tucker, Charles R., 4,540,521, Cl. 260-459.00A.
Tuckey, Charles H., to Walbro Corporation. Rotary fuel pump. 4,540,354, Cl. 418-15.000.
Tufts, Timothy A.: *See*—
Goel, Anil B.; and Tufts, Timothy A., 4,540,767, Cl. 528-60.000.
Tuller, Frank N.: *See*—
Garst, Roger H.; Tuller, Frank N.; and Tucker, Charles R., 4,540,521, Cl. 260-459.00A.
Tunc, Deger C., to Johnson & Johnson Products, Inc. Absorbable bone fixation device. 4,539,981, Cl. 128-92.00B.
Tunemoto, Daiei: *See*—
Sakai, Kunikazu; Tunemoto, Daiei; Kobori, Takeo; and Kondo, Kiyosi, 4,540,794, Cl. 548-127.000.
Turbowitz, Leslie; and Pipa, William, to Azrack-Hamway International, Inc. Amphibious toy vehicle. 4,540,376, Cl. 446-164.000.
Turner, S. Richard, to Exxon Research and Engineering Co. Copolymers of sodium styrene sulfonate and sodium-N-(4-sulfophenyl)-maleimide. 4,540,762, Cl. 526-262.000.
Turner, S. Richard: *See*—
Peiffer, Dennis G.; Lundberg, Robert D.; Walker, Thad O.; and Turner, S. Richard, 4,540,496, Cl. 252-8.50A.
Turney, David L.: *See*—
Bishop, Charles D.; Stamps, Kenneth H.; and Turney, David L., 4,539,898, Cl. 99-336.000.
Tuthill Corporation: *See*—
Richardson, William D., 4,540,201, Cl. 285-101.000.
Tyler, Henry P.: *See*—
Colan, Peter V.; Miller, Kenneth L.; and Tyler, Henry P., 4,539,891, Cl. 91-49.000.
Tynan, Richard F.: *See*—
Acitelli, Mario A.; Tynan, Richard F.; and Wayson, Alan R., 4,540,595, Cl. 427-7.000.
Tzincoca, Alexandre, to Entreprise Generale Industrielle. Self elevating formwork installation with variable geometry for making concrete surfaces, particularly very high concrete surfaces. 4,540,150, Cl. 249-20.000.
Ube Industries, Ltd.: *See*—
Inaba, Yukio; Igarashi, Taisei; Tahara, Susumu; and Miyatake, Takashi, 4,540,800, Cl. 549-462.000.
Uchida, Minoru; Nishi, Takao; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Company, Limited. Tetrazole derivatives, anti-ulcer composition containing the same and method for treating ulcers. 4,540,703, Cl. 514-381.000.
Uchiyama, Kaoru: *See*—
Kaida, Shinichi; and Uchiyama, Kaoru, 4,540,456, Cl. 156-159.000.
Ueda, Ikuo; Kato, Masayuki; and Kasai, Yoshiharu, to Fujisawa Pharmaceutical Co., Ltd. Anti-inflammatory N-(1-oxo-2,4,6-cycloheptatrienyl)2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide derivatives, compositions, and method of use. 4,540,692, Cl. 514-225.000.
Ueda, Ikuo; Morino, Daizo; and Takimoto, Koichi, to Fujisawa Pharmaceutical Co., Ltd. 2-Nitroxymethyl and 2,6-bis-nitroxymethylpyridine compounds having vasodilating activity. 4,540,701, Cl. 514-357.000.
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, to Eisai Co., Ltd. Treating complications of diabetes mellitus with hydantoin derivatives. 4,540,704, Cl. 514-389.000.
Ueno, Keiji: *See*—
Nagasaki, Shoji; Kojima, Keiichi; and Ueno, Keiji, 4,540,597, Cl. 427-44.000.
Uetsuki, Haruo; and Kobayashi, Takehiro, to Ryobi Ltd. Device for controlling a click brake on a fly reel. 4,540,135, Cl. 242-84.51R.
Uhing, Eugene H., to Stauffer Chemical Company. Reaction products of unsaturated hydrocarbons with P_4S_{10} and PSX_3. 4,540,526, Cl. 260-936.000.
Ukai, Norio; and Tomizuka, Katsushige, to Asahi Kasei Kogyo Kabushiki Kaisha. Process and apparatus for producing easily dyeable polyester false-twisted yarns. 4,539,805, Cl. 57-290.000.
Ullman, Edwin F.: *See*—
Litman, David J.; and Ullman, Edwin F., 4,540,659, Cl. 435-7.000.
Umetco Minerals Corporation: *See*—
Gardner, Harry E., 4,540,562, Cl. 423-592.000.
Uni-Cardan Aktiengesellschaft: *See*—
Krude, Werner, 4,540,385, Cl. 464-113.000.
Unie van Kunstmestfabrieken B.V.: *See*—
van Nassau, Petrus J. M.; Biermans, Andreas J.; Jonckers, Kees; and de Cooker, Mario G. R. T., 4,540,813, Cl. 564-71.000.
Union Carbide Corporation: *See*—
Barber, Alan G., 4,540,443, Cl. 134-2.000.
Chou, David T.; Durden, John A.; and D'Silva, Themistocles D. J., 4,540,578, Cl. 514-349.000.
Corwin, Michael A.; and Foster, George N., 4,540,538, Cl. 264-211.000.
Dombek, Bernard D., 4,540,712, Cl. 518-700.000.
Johnson, Robert N.; and Karol, Frederick J., 4,540,758, Cl. 526-130.000.
Kamp, Ewald A., 4,540,537, Cl. 264-171.000.
Matzner, Markus; and Papuga, Donald M., 4,540,748, Cl. 525-420.000.
Nicholson, Myron D.; and Beckman, John H., 4,540,613, Cl. 428-36.000.
Ream, Bernard C.; and Tellis, Cyril, 4,540,552, Cl. 423-226.000.
Union Oil Company of California: *See*—
Fenton, Donald M., 4,540,836, Cl. 568-902.000.
Simpson, Howard D.; Richardson, Ryden L.; and Angmorter, Paul K., 4,540,483, Cl. 208-216.0PP.
Unisearch Limited: *See*—
Antony, Gabriel; and Frost, Richard B., 4,539,754, Cl. 33-169.00R.
United Catalysts, Inc.: *See*—
Kustes, William A.; and Hausberger, Arthur L., 4,540,681, Cl. 502-234.000.
United States of America
Agriculture: *See*—
Wehr, Michael A.; and Mattson, James A., 4,540,033, Cl. 144-34.00R.
Air Force: *See*—
Burns, Bryan L.; and Callahan, Michael W., 4,540,978, Cl. 340-554.000.
Ennis, John J.; and Booher, Robert K., 4,540,904, Cl. 307-473.000.
Hawrylo, Frank Z., 4,540,450, Cl. 148-171.000.
Horvath, Richard L., 4,540,339, Cl. 416-92.000.
Stanley, Richard L.; and Henry, George R., 4,539,809, Cl. 60-39.094.
Wallace, J. Shield; and Arnold, Fred E., 4,540,833, Cl. 568-766.000.
Wiebe, David J., 4,539,864, Cl. 74-573.00R.
Army: *See*—
Flatau, Abraham, 4,539,911, Cl. 102-374.000.
Energy: *See*—
Amer, Nabil M., 4,540,285, Cl. 356-432.000.
Carey, A. Andrew; and Shor, Joel T., 4,540,503, Cl. 252-78.300.
Giordano, Salvatore, 4,540,960, Cl. 333-228.000.
Grossman, Robert J., 4,539,846, Cl. 73-579.000.
Iacovangelo, Charles D.; and Browall, Kenneth W., 4,540,640, Cl. 429-41.000.
Johnson, Eric A.; Demain, Arnold L.; and Madia, Ashwin, 4,540,664, Cl. 435-99.000.
Kaun, Thomas D., 4,540,642, Cl. 429-131.000.
Lambert, Donald R., 4,540,203, Cl. 285-226.000.
Mallon, Richard G.; Walton, Otis R.; Lewis, Arthur E.; and Braun, Robert L., 4,539,917, Cl. 110-256.000.
Pavelka, Edwin A.; Grindstaff, Quirinus G.; and Scheppele, Stuart E., 4,540,304, Cl. 403-12.000.
Sugama, Toshifumi; Kukacka, Lawrence E.; and Horn, William H., 4,540,726, Cl. 523-505.000.
Ternes, Mark P.; and Kedl, Robert J., 4,540,501, Cl. 252-70.000.
National Aeronautics and Space Administration: *See*—
Byrne, Frank, 4,540,986, Cl. 343-6.80R.
Cawley, James D., 4,540,336, Cl. 415-174.000.
Navy: *See*—
Dale, Lawrence A.; Grenleski, Stephen E., Jr.; Keirsey, James L.; and Stevens, Charles E., 4,539,811, Cl. 60-270.100.
Matsuo, Jon T., 4,540,145, Cl. 244-152.000.
Munk, Benedikt A.; and Larson, Clayton J., 4,540,988, Cl. 343-728.000.
Roquemore, Glenn R.; Smith, Patrick E.; and Banks, Eric W., 4,540,315, Cl. 405-264.000.
Swiatosz, Edmund; Grimmer, Paul D.; and Sciascia, Rocco M., 4,539,986, Cl. 128-205.130.
U.S. Philips Corporation: *See*—
McGinty, Gordon K., 4,540,876, Cl. 219-405.000.
Sahakian, Diran-Robert, 4,540,533, Cl. 264-1.400.
Sieben, Joannes H. F. C., 4,541,024, Cl. 360-85.000.
Teuling, Dirk J. A., 4,540,933, Cl. 323-271.000.
Vries, Lodewijk B., 4,541,095, Cl. 371-69.000.

United States Pipe and Foundry Company: *See*—
Battle, Billy J.; Graham, Robert M.; Jones, Lawrence S.; Malizio, Andrew B.; and Rhodes, George F., 4,540,204, Cl. 285-231.000.

United States Steel Corporation: *See*—
Johnson, William R.; and Pfister, Larry E., 4,540,472, Cl. 204-28.000.

United Technologies Corporation: *See*—
Durno, Ronald A.; and Huber, Rudolph F., 4,540,141, Cl. 244-17.190.
Perrella, Andrew P., 4,540,144, Cl. 244-135.00A.

University of California, The Regents of the: *See*—
Orser, Cindy; Loper, Joyce; Panopoulos, Nickolas; Lindow, Steven; and Schroth, Milton N., 4,540,667, Cl. 435-172.300.

University of Florida: *See*—
Bodor, Nicholas S., 4,540,564, Cl. 424-9.000.

University of Georgia Research Foundation, Inc.: *See*—
Anderson, James L.; and Brewster, Jeffrey D., 4,540,280, Cl. 356-246.000.

University of Kentucky Research Foundation: *See*—
Swetnam, Larry D.; Casada, James H.; and Walton, Linus R., 4,540,054, Cl. 172-292.000.

University of Maine, Board of Trustees of the: *See*—
Genco, Joseph M.; and Hassler, John C., 4,540,468, Cl. 162-49.000.

University of Utah: *See*—
Miller, Jan D.; and Mooiman, Michael B., 4,540,435, Cl. 75-118.00R.

Uno, Motoo: *See*—
Maeda, Takeshi; Uno, Motoo; and Takasago, Masahiro, 4,541,083, Cl. 369-44.000.

UOP Inc.: *See*—
Briggs, Bruce A., 4,540,831, Cl. 568-697.000.

Upjohn Company, The: *See*—
Barsa, Edward A., 4,540,781, Cl. 544-193.000.
Gammill, Ronald B., 4,540,798, Cl. 549-387.000.
Hannon, Betty R.; Reusser, Fritz; Dolak, Lester A.; Argoudelis, Alexander D.; and Castle, Thomas M., 4,540,661, Cl. 435-42.000.
Szmuszkovicz, Jacob, 4,540,690, Cl. 514-210.000.

Ura, Mitsuru: *See*—
Takeda, Yukio; Ogihara, Satoru; Ura, Mitsuru; Nakamura, Kousuke; Asai, Tadamichi; Ohkoshi, Tokio; Matsushita, Yasuo; and Maeda, Kunihiro, 4,540,673, Cl. 501-96.000.

Uro Denshi Kogyo Kabushiki Kaisha: *See*—
Kodaira, Makoto, 4,541,080, Cl. 367-94.000.

Ushio Denki Kabushiki Kaisha: *See*—
Arai, Tetsuji; and Igarashi, Tatsushi, 4,540,911, Cl. 313-44.000.

USM Corporation: *See*—
Peck, Alan M.; Reedman, David C.; Graveling, Frederick J.; Moore, David; and Mansfield, Graham J., 4,541,054, Cl. 364-474.000.
Simmonds, Robert C., Jr.; Gilbride, Andrew J.; and Morse, Albert I., 4,540,608, Cl. 427-282.000.

Vaal, John G.: *See*—
Neyens, Edward J.; and Vaal, John G., 4,540,958, Cl. 332-16.00R.

Valmet OY: *See*—
Eskelinen, Pekka; and Vuorinen, Vesa, 4,539,762, Cl. 34-114.000.

Valspar Corporation, The: *See*—
Lynch, Conrad L.; and Tobias, Michael A., 4,540,751, Cl. 525-517.500.

van Arragon, Gerrit W.: *See*—
Boute, Wim; Wittkampf, Frederik H. M.; and van Arragon, Gerrit W., 4,539,991, Cl. 128-419.0PG.

van der Loos, Jozef L. M.: *See*—
van Geenen, Albert A.; Bongers, Joseph J. M.; van der Loos, Jozef L. M.; and Vrinssen, Cornelis H., 4,540,515, Cl. 260-239.30R.
van Geenen, Albert A.; Bongers, Joseph J. M.; and van der Loos, Jozef L. M., 4,540,516, Cl. 260-239.30R.

van der Maas, Hendrikus: *See*—
Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; van der Maas, Hendrikus; and Suerken, Hans-Peter, 4,540,777, Cl. 536-102.000.

Vanderpool, Steven H., to Texaco, Inc. Regenerative process for the preparation of linear polyethylenepolyamines using a supported catalyst. 4,540,822, Cl. 564-479.000.

Van Der Puy, Michael; Hendrickson, Larry L.; Kolc, Jaroslav F.; Rogic, Milorad M.; and Swerdloff, Michael D., to Allied Corporation. Phosphorotriamidate urease inhibitors and urease inhibited urea based fertilizer compositions. 4,540,428, Cl. 71-28.000.

van Geenen, Albert A.; Bongers, Joseph J. M.; van der Loos, Jozef L. M.; and Vrinssen, Cornelis H., to Stamicarbon B.V., Licensing Subsidiary of DSM. N-Substituted carbamoyl-lactam compound. 4,540,515, Cl. 260-239.30R.

van Geenen, Albert A.; Bongers, Joseph J. M.; and van der Loos, Jozef L. M., to Stamicarbon B.V., Licensing Subsidiary of DSM. Process for the preparation of an N-substituted carbamoyl-lactam compound. 4,540,516, Cl. 260-239.30R.

van Linden, Jan H. L.; and Whitehead, James S., to Aluminum Company of America. Press for recovering metal from dross. 4,540,163, Cl. 266-201.000.

van Nassau, Petrus J. M.; Biermans, Andreas J.; Jonckers, Kees; and de Cooker, Mario G. R. T., to Unie van Kunstmestfabrieken B.V. Process for the preparation of urea. 4,540,813, Cl. 564-71.000.

Van Noord, Andrew J. Knockdown lamp assembly. 4,541,038, Cl. 362-352.000.

Van Overloop, Ronald R., to Kendall Company, The. Device for moist heat therapy. 4,540,412, Cl. 604-291.000.

Vas es Moszeripari Szovetkezet: *See*—
Kiszel, Janos; Papp, Laszlo ; and Nagy, Laszlo , 4,539,984, Cl. 128-204.230.

Veaux, Jacques; and Derrien, Michel, to Messier-Hispnao-Bugatti (S.A.). Nose-wheel type landing gear for aircraft. 4,540,142, Cl. 244-102.00R.

VEB Leuna Werke "Walter Ulbricht": *See*—
Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Renker, Wolfgang; and Kober, Roland, 4,540,494, Cl. 210-750.000.

Vecellio, Anthony M., to General Motors Corporation. Robot painting system for automobiles. 4,539,932, Cl. 118-697.000.

Veit, Werner, to Sandoz Ltd. Method for producing 1-naphthol-4-sulphonic acid. 4,540,525, Cl. 260-512.00C.

Veitscher Magnesitwerke-actien-Gesellschaft: *See*—
Karl, Otto, 4,540,039, Cl. 165-9.400.

Velsicol Chemical Corporation: *See*—
Nickell, Louis G.; Stach, Leonard J.; and Luteri, George F., 4,540,431, Cl. 71-107.000.

Venus Scientific Inc.: *See*—
Sandler, Steven M., 4,541,039, Cl. 363-21.000.

Vermersch, Marc: *See*—
Oneto, Francis E. J.; and Vermersch, Marc, 4,540,567, Cl. 424-45.000.

Vermes, Geza: *See*—
Beer, Janos M.; Dilmore, James A.; Vermes, Geza; and Young, William E., 4,539,918, Cl. 110-266.000.

VerStrate, Gary W.: *See*—
Cozewith, Charles; Ju, Shiaw; and VerStrate, Gary W., 4,540,753, Cl. 526-88.000.

Vertimag Systems Corporation: *See*—
Bonin, Wayne A.; and Dugas, Matthew P., 4,541,026, Cl. 360-121.000.

Vesuvius Crucible Company: *See*—
Morris, Martin; and Fishler, Mark K., 4,540,675, Cl. 501-99.000.

VFP Fluid Power Limited: *See*—
Davies, Anthony R., 4,540,346, Cl. 417-273.000.

Vick, Walter; and Suhrbier, Rolf, to F.H. Schule GmbH. Husking machine for cereals. 4,539,904, Cl. 99-618.000.

Vickers, James H.: *See*—
Frame, William R.; and Vickers, James H., 4,540,206, Cl. 292-66.000.

Victor Company of Japan, Ltd.: *See*—
Watanabe, Yasuaki, 4,541,018, Cl. 358-314.000.

Vinegar, Harold J.; and Wellington, Scott L., to Shell Oil Company. Method of determining drilling fluid invasion. 4,540,882, Cl. 250-255.000.

Virtanen, Pentti. Apparatus for the manufacture of a precast building element of concrete. 4,540,358, Cl. 425-63.000.

Viscontini, Max, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. 1',2'-Diacyl-(6R,S)-5,6,7,8-tetrahydro-L-biopterin and process for preparing the same. 4,540,783, Cl. 544-258.000.

Vista Chemical Company: *See*—
Yang, Kang, 4,540,828, Cl. 568-616.000.

Vitafin N.V.: *See*—
Boute, Wim; Wittkampf, Frederik H. M.; and van Arragon, Gerrit W., 4,539,991, Cl. 128-419.0PG.

Vitzthum, Otto G.; Werkhoff, Peter; and Gehrig, Manfred, to Hag GF Aktiengesellschaft. Recovery of caffeine adsorbed to activated carbon. 4,540,784, Cl. 544-274.000.

Voegel, Robert L., to Aluminum Company of America. Light level electrode setting gauge and method of use. 4,540,474, Cl. 204-67.000.

Vogdes, Christine E., to Raychem Corporation. Polyamide compositions. 4,540,727, Cl. 524-83.000.

Vogel, Victor J., to American Standard Inc. Self-cleaning slidable cover and track assembly for pneumatic carrier terminal. 4,540,317, Cl. 406-112.000.

Vollmer, Jurgen: *See*—
Geisthoff, Hubert; Vollmer, Jurgen; and Herchenbach, Paul, 4,540,305, Cl. 403-13.000.

Vollrath Company, The: *See*—
Klasen, Daniel A.; and Denucci, John F., 4,540,207, Cl. 292-341.170.

von Philipsborn, Gerda: *See*—
Franke, Albrecht; Muller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Gunther; Muller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,540,697, Cl. 514-255.000.

Voors, Wilhelm P. H.: *See*—
Servas, Vladimiros; and Voors, Wilhelm P. H., 4,540,287, Cl. 366-7.000.

Voronin, Evgeny F.: *See*—
Chuiko, Alexei A.; Morev, Anatoly V.; Golovkov, Alexandr S.; Smirnov, Valentin A.; Voronin, Evgeny F.; Evlakhova, Raisa A.; Guba, Galina Y.; Slushnene, Iolita R.; Pasvyanskas, Arunas V.; and Sushko, Roman V., 4,540,652, Cl. 430-84.000.

Vries, Lodewijk B., to U.S. Philips Corporation. System for communication by way of repeatedly transmitted messages, and stations for use in such a system. 4,541,095, Cl. 371-69.000.

Vrinssen, Cornelis H.: *See*—
van Geenen, Albert A.; Bongers, Joseph J. M.; van der Loos, Jozef L. M.; and Vrinssen, Cornelis H., 4,540,515, Cl. 260-239.30R.

Vuorinen, Vesa: *See*—
Eskelinen, Pekka; and Vuorinen, Vesa, 4,539,762, Cl. 34-114.000.

W. Schlafhorst & Co.: *See*—
Derichs, Josef, 4,539,804, Cl. 57-263.000.

Waatti, Kurt J.; and Border, Daniel R., to Morton Thiokol, Inc. Surfactant and alkali metal citrate composition for recharging a water softener. 4,540,715, Cl. 521-26.000.
Wacker-Chemie GmbH: *See*—
Schmidhammer, Ludwig; Dummer, Gerhard; Haselwarter, Klaus; and Strasser, Rudolf, 4,540,837, Cl. 570-211.000.
Wada, Kenichi; Shintani, Yooichi; Shimizu, Tsuguo; and Yamaoka, Akira, to Hitachi, Ltd. Pipelined data processing system. 4,541,047, Cl. 364-200.000.
Wadsworth, Charles; and Juergens, Dieter, to Harnischfeger Corporation. Crane with outboard counterweight carrier. 4,540,097, Cl. 212-196.000.
Wagner, James A., to LRV Corporation. Truck bed liner securing fixture. 4,540,214, Cl. 296-39.00R.
Wakabayashi, Tsuneo: *See*—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Hideki, Ono; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,540,704, Cl. 514-389.000.
Wakasugi, Mitsuharu, to Yamamoto Scientific Co., Ltd. Distilled water production device. 4,540,470, Cl. 202-180.000.
Wakata, Shigekazu: *See*—
Saijo, Eiji; and Wakata, Shigekazu, 4,540,233, Cl. 339-258.00R.
Walbro Corporation: *See*—
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Clancy, Steven J.; Whatley, James F.; and Heinke, Dennis, 4,540,985, Cl. 343-5.0DP.
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Johnston, Robert J.; Layciak, Stephen G.; and Colista, Dominic, 4,539,860, Cl. 74-483.0PB.
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Wilhelm, James H., to Central Illinois Public Service Company. Dual alkali scrubber liquor regeneration with production of gypsum. 4,540,556, Cl. 423-242.000.
Wilkinson, Donald R., to R. J. Reynolds Tobacco Company. Orientation, accumulation and positioning machine. 4,539,795, Cl. 53-542.000.
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Williams, Donald L., to General Motors Corporation. Fuel injection system with fuel flow limiting valve assembly. 4,539,959, Cl. 123-456.000.
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Wilson, David A.; and Crump, Druce K., to Dow Chemical Company, The. Alkylene phosphonic acid scale inhibitor compositions. 4,540,508, Cl. 252-180.000.
Wilson, David J., to Matthews and Yates Limited. Material discharge unit. 4,540,421, Cl. 55-432.000.
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Wright, Terry L., to Dow Chemical Company, The. Preparation of 2-chloro-3-cyano-quinolines. 4,540,786, Cl. 546-162.000.
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Wuhrer, Wolfgang, to Escher Wyss GmbH. Adjustable propeller for marine vessel drive. 4,540,341, Cl. 416-157.00R.
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Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, to Kokusai Denshin Denwa Co., Ltd. Alternating current induction method using an annular magnetic coupling body for detecting the position of a buried submarine cable. 4,540,942, Cl. 324-326.000.
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Nishi, Kazuro; Kurahashi, Koichiro; Hashimoto, Tsutomu; Senoo, Toshihiko; and Yamato, Shinji, 4,540,247, Cl. 350-3.710.
Yamaura, Mitsuru: *See*—
Andow, Fumio; Yamaura, Mitsuru; and Kondow, Ryotaro, 4,541,058, Cl. 364-483.000.
Yamazaki, Seiichi: *See*—
Kogane, Mikio; and Yamazaki, Seiichi, 4,540,324, Cl. 414-20.000.
Yamazaki, Yoshihiko, to Nissei Plastics Industrial Co., Ltd. Injection molding machine. 4,540,359, Cl. 425-135.000.
Yanagiuchi, Shigenobu: *See*—
Kanou, Ikuo; Yanagiuchi, Shigenobu; and Omori, Takuro, 4,541,069, Cl. 364-900.000.
Yang, Kang, to Vista Chemical Company. Catalysts for alkoxylation reactions. 4,540,828, Cl. 568-616.000.
Yasunaga, Makoto: *See*—
Okunishi, Mizuho; and Yasunaga, Makoto, 4,540,295, Cl. 400-120.000.
Yasuoka, Hirotoshi, to Mitsubishi Denki Kabushiki Kaisha. Welding torch. 4,540,869, Cl. 219-124.340.
Yatsuhashi, Kiyomi: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,540,951, Cl. 330-267.000.
Yau, David W. T.; and Modavis, Robert A., to International Business Machines Corporation. Thermo-mechanical overlay signature tuning for Perkin-Elmer mask aligner. 4,540,251, Cl. 350-611.000.
Yeakey, Ernest L.: *See*—
Larkin, John M.; Yeakey, Ernest L.; and Watts, Lewis W., Jr., 4,540,821, Cl. 564-473.000.
Yew, Ming-Chih: *See*—
Finn, Bernard J.; and Yew, Ming-Chih, 4,540,197, Cl. 280-697.000.
Ying, Lincoln, to J&J Dental Products Inc. Dental restorative composition containing monofunctional monomer and diolefinically unsaturated monomer. 4,540,723, Cl. 523-115.000.
Yoko, Kiyoshi: *See*—
Komazawa, Hiroyasu; Hotta, Hiroshi; Nakatsuji, Hiroshi; Yoko, Kiyoshi; Higashiyama, Seiichi; Nakashima, Tuneyasu; and Gotoh, Noboru, 4,540,773, Cl. 528-480.000.
Yokogawa, Fumihiko: *See*—
Takaoka, Saburo; Naito, Ryuichi; Yokogawa, Fumihiko; and Ogawa, Youichi, 4,540,897, Cl. 307-268.000.
Yokoshima, Minoru; Nawata, Kazuyoshi; Ohkubo, Tetsuo; and Hattori, Hideaki, to Nippon Kayaku Kabushiki Kaisha. (Meth) acrylate esters of dipentaerythritol caprolactone condensates. 4,540,809, Cl. 560-185.000.
Yokosuka, Koichi, to Seiko Instruments & Electronics Ltd. Buckle for a watch band. 4,539,736, Cl. 24-644.000.
Yokoya, Satoshi: *See*—
Shimizu, Yoshio; and Yokoya, Satoshi, 4,541,109, Cl. 381-15.000.
Yokoyama, Yuichi: *See*—
Kawamura, Kazunori; Yamashita, Shinichi; Yokoyama, Yuichi; and Tsuchiya, Makoto, 4,540,761, Cl. 526-245.000.
Yoneda, Kenji; and Sugihara, Kunihiko, to Nissan Motor Co., Ltd. Fuel injection nozzle. 4,540,126, Cl. 239-533.400.
Yoneda, Tetsuzo; and Sato, Masanori, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Transmission housing arrangement. 4,539,865, Cl. 74-606.00R.
Yonezawa, Kazuya: *See*—
Tomita, Haruo; and Yonezawa, Kazuya, 4,540,802, Cl. 549-557.000.
Yonezawa, Seiji: *See*—
Horikoshi, Tatsuo; Yonezawa, Seiji; Tsuyoshi, Toshiaki; Tooyama, Hiroshi; and Otake, Masatoshi, 4,541,082, Cl. 369-44.000.
Yonovich, John R.; Newton, William P.; and Dense, Brian S., to Caldwell Manufacturing Co., Inc. Vibration dampener for coil tension window balance spring. 4,540,070, Cl. 188-380.000.
Yorita, Mitsumasa: *See*—
Okumura, Mitsuhiro; Naya, Eizo; Yorita, Mitsumasa; and Takeya, Yasushi, 4,540,861, Cl. 200-144.00B.
York, Billie M., Jr., to Alcon Laboratories, Inc. Treatment of diabetic complications with certain spiro-imidazolidine-diones. 4,540,700, Cl. 514-278.000.
Yoshida, Hiroshi, to Yoshida Kogyo K. K. Separable slide fastener. 4,539,733, Cl. 24-396.000.
Yoshida Kogyo K. K.: *See*—
Watanabe, Kozo, 4,540,619, Cl. 428-192.000.
Yoshida, Hiroshi, 4,539,733, Cl. 24-396.000.
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; Kajiyama, Takashi; and Hotta, Kunihiko, to Nippon Light Metal Company Limited. Aluminum substrate for magnetic recording media. 4,540,449, Cl. 148-31.500.
Yoshida, Ryo: *See*—
Konishi, Hiroyuki; Hino, Naganori; Matsumoto, Hiroshi; and Yoshida, Ryo, 4,540,824, Cl. 568-45.000.
Yoshida, Yukio: *See*—
Fukumoto, Ryutaro; Oyagi, Shuji; Yoshida, Yukio; and Akimoto, Ryosaku, 4,540,040, Cl. 165-12.000.
Yoshikawa, Yasuo: *See*—
Hara, Seinosuke; Miisho, Kazuyuki; Matsumoto, Yasuo; and Yoshikawa, Yasuo, 4,539,951, Cl. 123-90.170.
Yoshikumi, Chikao: *See*—
Muto, Shigeaki; Niimura, Kouichi; Ando, Takao; Kanno, Akihiko; Furusho, Takao; and Yoshikumi, Chikao, 4,540,689, Cl. 514-196.000.
Yoshimitsu, Arata: *See*—
Yamakami, Yoshiaki; and Yoshimitsu, Arata, 4,540,424, Cl. 65-100.000.
Yoshimura, Kunimasa: *See*—
Kobayashi, Hideo; Kashiwagi, Takao; Yoshimura, Kunimasa; and Mae, Hisao, 4,539,942, Cl. 123-41.100.
Yoshimura, Yoshito: *See*—
Oshima, Noboru; Shimizu, Isamu; and Yoshimura, Yoshito, 4,540,744, Cl. 525-332.900.

Young, Raymond W., to Amity Leather Products Co. Money clip and wallet. 4,540,034, Cl. 150-137.000.
Young, Richard K. Tube and shell heat exchanger with annular distributor. 4,539,940, Cl. 122-32.000.
Young, William E.: *See*—
Beer, Janos M.; Dilmore, James A.; Vermes, Geza; and Young, William E., 4,539,918, Cl. 110-266.000.
Yumino, Masamichi: *See*—
Ozawa, Akio; Sueyoshi, Susumu; Sato, Keishi; Ishikawa, Kikuo; Yatsuhashi, Kiyomi; Ishii, Satoshi; and Yumino, Masamichi, 4,540,951, Cl. 330-267.000.
Yuzawa, Keiji, to Casio Computer Co., Ltd. Automatic accompaniment generating apparatus. 4,539,882, Cl. 84-1.030.
Zackay, Victor F.: *See*—
Stuck, Earl N.; and Zackay, Victor F., 4,539,930, Cl. 118-300.000.
Zadiraka, Allan J., to Babcock & Wilcox Company, The. Pulverizer control system. 4,540,129, Cl. 241-34.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Magg, Alfred; and Griesser, Walter, 4,540,074, Cl. 192-53.00G.
Zahradnik, Robert T., to Johnson & Johnson Dental Products Company. Neutral topical sodium fluoride gel. 4,540,576, Cl. 424-151.000.
Zamboni, Alderino, to Risvin - Ricerche e Sviluppo Industriale S.r.l. Apparatus for the continuous wrapping of sweets or like products in a so-called double twist wrapper. 4,539,790, Cl. 53-227.000.
Zamboni, Alderino, to Risvin - Ricerche E Sviluppo Industriale S.r.l. Continuously moving handling device for packing machines in particular for sweets and similar products. 4,539,791, Cl. 53-234.000.
Zamboni, Alderino, to Risvin - Ricerche E Sviluppo Industriale S.r.l. Apparatus for sequential supply of sweets or like articles to continuously moving packing apparatus or machines. 4,539,792, Cl. 53-234.000.
Zanavich, James K.; and Smith, Alfred M. Rail fence. 4,540,160, Cl. 256-19.000.
Zelek, Thomas J.; and Ellsworth, John C. Inclined thermal transfer enhancement system. 4,540,042, Cl. 165-96.000.
Zelinka, Richard J.; Sutherland, George K.; and Thielen, Thomas J., to Sys-Tec, Inc. Constant current closed loop controller for rotating system. 4,540,877, Cl. 219-497.000.
Zelkowitz, Phillip, to Albany-Chicago Corporation. Multiple magnet core unit. 4,540,966, Cl. 335-297.000.
Zenner, Walter J. Dot matrix line printer and print element driver assembly therefor. 4,539,905, Cl. 101-93.050.
Zenzo, Tamura: *See*—
Imai, Kazuhiro; Zenzo, Tamura; and Shin-Ichiro, Kobayashi, 4,540,548, Cl. 422-52.000.
Zevatron GmbH Gesellschaft fur Fertigungseinrichtungen der Elektronik: *See*—
Pachschwoll, Heino, 4,540,114, Cl. 228-37.000.
Zibung, Rene A., to Swisstronic (Proprietary) Limited. Terminal box apparatus. 4,540,232, Cl. 339-198.00G.
Ziegler, Horst, to Siemens Aktiengesellschaft. Pressure or pressure-difference measuring apparatus with a pressure sensor device protected against overload. 4,539,850, Cl. 73-706.000.
Zierten, Thomas A.: *See*—
Wang, Timothy; and Zierten, Thomas A., 4,540,143, Cl. 244-130.000.
Zimmer, Erich, to Water Engineering and Plant Construction GtA reg. Trust. Method of and apparatus for the mechanical-biological treatment of sewage. 4,540,491, Cl. 210-619.000.
Zimmermann, William D., to Kendall Company, The. Acrylic adhesive composition comprising an alpha amino phosphonic acid or salt having improved stability. 4,540,738, Cl. 524-707.000.
Zingl, Hans, to Ingersoll-Rand Company. Power feed system for a rotary drill. 4,539,893, Cl. 92-52.000.
Zinsmeyer, Thomas M., to Carrier Corporation. Protective capacity control system for a refrigeration system. 4,539,820, Cl. 62-201.000.
Zintmeyer & Lux AG: *See*—
Schaub, Michael M.; and Zintzmeyer, Jorg, 4,540,071, Cl. 190-121.000.
Zintzmeyer, Jorg: *See*—
Schaub, Michael M.; and Zintzmeyer, Jorg, 4,540,071, Cl. 190-121.000.
3S S.A.: *See*—
Taillens, Jean-Francois; and Lechner, Heinz, 4,540,977, Cl. 340-552.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF SEPTEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Basic American Foods: *See*—
Beck, Roderick G.; Parks, Lyle H.; Shatila, Mounir A.; and Pulley, Arden O., Re. 31,982, Cl. 426-550.000.
Beck, Roderick G.; Parks, Lyle H.; Shatila, Mounir A.; and Pulley, Arden O., Re. 31,983, Cl. 426-550.000.

Beck, Roderick G.; Parks, Lyle H.; Shatila, Mounir A.; and Pulley, Arden O., to Basic American Foods. Dehydrated potato processes. Re. 31,982, Cl. 426-550.000.

Beck, Roderick G.; Parks, Lyle H.; Shatila, Mounir A.; and Pulley, Arden O., to Basic American Foods. Dehydrated potato processes and products. Re. 31,983, Cl. 426-550.000.

General Motors Corporation: *See*—
Lindbert, Brook A., Re. 31,981, Cl. 180-247.000.

Lindbert, Brook A., to General Motors Corporation. Control system for split axle drive mechanism. Re. 31,981, Cl. 180-247.000.

Parks, Lyle H.: *See*—
Beck, Roderick G.; Parks, Lyle H.; Shatila, Mounir A.; and Pulley, Arden O., Re. 31,982, Cl. 426-550.000.
Beck, Roderick G.; Parks, Lyle H.; Shatila, Mounir A.; and Pulley, Arden O., Re. 31,983, Cl. 426-550.000.

Pulley, Arden O.: *See*—
Beck, Roderick G.; Parks, Lyle H.; Shatila, Mounir A.; and Pulley, Arden O., Re. 31,982, Cl. 426-550.000.
Beck, Roderick G.; Parks, Lyle H.; Shatila, Mounir A.; and Pulley, Arden O., Re. 31,983, Cl. 426-550.000.

Shatila, Mounir A.: *See*—
Beck, Roderick G.; Parks, Lyle H.; Shatila, Mounir A.; and Pulley, Arden O., Re. 31,982, Cl. 426-550.000.
Beck, Roderick G.; Parks, Lyle H.; Shatila, Mounir A.; and Pulley, Arden O., Re. 31,983, Cl. 426-550.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

American Hospital Supply Corporation: *See*—
McPhee, Charles J., B1 4,354,492, Cl. 604-247.000.

Brown, Joe R.; Cochran, Chudleigh B.; and Montgomery, James W., to Hughes Tool Oil Co. Apparatus and method for cementing well liners. B1 3,910,349, 9-10-85, Cl. 166-153.000.

Cochran, Chudleigh B.: *See*—
Brown, Joe R.; Cochran, Chudleigh B.; and Montgomery, James W., B1 3,910,349, Cl. 166-153.000.

Fried Krupp Gesellschaft mit Beschrankter Haftung: *See*—
Rosenkranz, Otto; Goos, Heinz; and Seifert, Karl-Heinrich, B1 4,076,071, Cl. 165-2.000.

General Electric Company: *See*—
Katchman, Arthur; and Lee, Gim F., Jr., B1 4,128,602, Cl. 525-68.000.
McEntee, Harry R., B1 4,127,598, Cl. 556-442.000.

Goos, Heinz: *See*—
Rosenkranz, Otto; Goos, Heinz; and Seifert, Karl-Heinrich, B1 4,076,071, Cl. 165-2.000.

Hughes Tool Oil Co.: *See*—
Brown, Joe R.; Cochran, Chudleigh B.; and Montgomery, James W., B1 3,910,349, Cl. 166-153.000.

Johncock, Peter, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Epoxy compounds. B1 4,451,645, 9-10-85, Cl. 528-391.000.

Katchman, Arthur; and Lee, Gim F., Jr., to General Electric Company. Polyphenylene ether compositions containing rubber modified polystyrene. B1 4,128,602, 9-10-85, Cl. 525-68.000.

Lee, Gim F., Jr.: *See*—
Katchman, Arthur; and Lee, Gim F., Jr., B1 4,128,602, Cl. 525-68.000.

Marks, Alfred F., to SDS Biotech Corp. Flowable aqueous composition of water-insoluble pesticide. B1 3,948,636, 9-10-85, Cl. 71-112.000.

Matier, William L.: *See*—
Morrow, Duane F.; and Matier, William L., B1 4,243,681, Cl. 514-653.000.

McEntee, Harry R., to General Electric Co. Process for removing biphenyls from chlorosilanes. B1 4,127,598, 9-10-85, Cl. 556-442.000.

McPhee, Charles J., to American Hospital Supply Corporation. Medical administration set with backflow check valve. B1 4,354,492, 9-10-85, Cl. 604-247.000.

Mead Johnson & Company: *See*—
Morrow, Duane F.; and Matier, William L., B1 4,243,681, Cl. 514-653.000.

Montgomery, James W.: *See*—
Brown, Joe R.; Cochran, Chudleigh B.; and Montgomery, James W., B1 3,910,349, Cl. 166-153.000.

Morrow, Duane F.; and Matier, William L., to Mead Johnson & Company. Alkylthiophenoxypropanolamines and pharmaceutical compositions and uses thereof. B1 4,243,681, 9-10-85, Cl. 514-653.000.

Rosenkranz, Otto; Goos, Heinz; and Seifert, Karl-Heinrich, to Fried Krupp Gesellschaft mit Beschrankter Haftung. Method for heating plastics materials. B1 4,076,071, 9-10-85, Cl. 165-2.000.

SDS Biotech Corp.: *See*—
Marks, Alfred F., B1 3,948,636, Cl. 71-112.000.

Seifert, Karl-Heinrich: *See*—
Rosenkranz, Otto; Goos, Heinz; and Seifert, Karl-Heinrich, B1 4,076,071, Cl. 165-2.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Johncock, Peter, B1 4,451,645, Cl. 528-391.000.

LIST OF DESIGN PATENTEES

Abel, William E., to Sentrol, Inc. Housing for a personal transmitter for use in an emergency alarm system. 280,494, 9-10-85, Cl. D10-106.000.

Alessandro, Sante G., to Erwin Lambeth, Inc. Lamp base. 280,554, 9-10-85, Cl. D26-110.000.

Allied Corporation: *See*—
Bass, Saul, 280,528, Cl. D18-24.000.

Allison Corporation: *See*—
Seltzer, Samuel M.; and Dennison, Saul, 280,466, Cl. D3-40.000.

Alsup, James D., Jr.; and Bartlett, Randall N., to Syntex (U.S.A.) Inc. Transparency viewer. 280,517, 9-10-85, Cl. D16-14.000.

Althans, Richard K.: *See*—
Claxton, Bruce A.; and Althans, Richard K., 280,507, Cl. D14-68.000.

Ambig Products Limited: *See*—
Bentall, Simon W., 280,559, Cl. D30-14.000.

American Cyanamid Company: *See*—
Becker, Douglas C., 280,557, Cl. D28-3.000.
Mittleberg, Eric M., 280,556, Cl. D28-3.000.

American Home Products Corporation: *See*—
Von Till, Paul S., 280,538, Cl. D22-19.000.

Ampex Corporation: *See—*
Wilson, George A., 280,510, Cl. D14-106.000.
Anderson Burr Pictures Limited: *See—*
Begg, Steven W., 280,532, Cl. D21-87.000.
Aoki, Akio, to Figgie International Inc. Baseball glove. 280,462, 9-10-85, Cl. D2-361.000
Arneson Products, Inc.: *See—*
Gard, John L., 280,561, Cl. D32-1.000.
Associated Mills, Inc.: *See—*
Grube, Clifford E., 280,555, Cl. D27-27.000.
AT&T Bell Laboratories: *See—*
Genaro, Donald M.; and McGarvey, John N., 280,505, Cl. D14-60.000.
Barker Company, Ltd.: *See—*
McMahon, John P.; and McMahon, J. Patrick, 280,476, Cl. D6-470.000.
Bartlett, Randall N.: *See—*
Alsup, James D., Jr.; and Bartlett, Randall N., 280,517, Cl. D16-14.000.
Bass, Saul, to Allied Corporation. Font of alphanumeric characters. 280,528, 9-10-85, Cl. D18-24.000.
Baum, Frank M. Video recorder bag. 280,465. 9-10-85. Cl. D3-33.000.
Bausch & Lomb Incorporated: *See—*
Zancaner, Trudy H., 280,519, Cl. D16-102.000.
Becker, Douglas C., to American Cyanamid Company. Tablet. 280,557, 9-10-85, Cl. D28-3.000.
Begg, Steven W., to Anderson Burr Pictures Limited. Toy spacecraft. 280,532, 9-10-85, Cl. D21-87.000.
Bell, Randall P.: *See—*
Lazar, Ralph M.; Peterson, Kurt T.; and Bell, Randall P., 280,558, Cl. D28-13.000.
Bentall, Simon W., to Ambig Products Limited. Bird feeder. 280,559, 9-10-85, Cl. D30-14.000.
Bromley, R. Scott, to Cartier, Inc. Wall mounted cabinet. 280,480, 9-10-85, Cl. D6-559.000.
Brooks, Leonard J., Jr.; and Sawyer, Richard C., Jr., to McGraw-Edison Company. Guy wire marker. 280,500, 9-10-85, Cl. D13-13.000.
Brunswick Corporation: *See—*
Miller, Vernon R.; and Hatch, Edwin B., 280,541, Cl. D22-25.000.
Robbins, Richard J.; Fee, Robert W.; Miller, Vernon R.; and Hatch, Edwin B., 280,539, Cl. D22-25.000.
Robbins, Richard J.; Fee, Robert W.; Miller, Vernon R.; and Hatch, Edwin B., 280,540, Cl. D22-25.000.
Canon Kabushiki Kaisha: *See—*
Sugiyama, Masako, 280,530, Cl. D19-60.000.
Carignan, Roger G.: *See—*
Pratt, Clyde R.; and Carignan, Roger G., 280,550, Cl. D24-27.000.
Carlson, Ann, to Carlson Dolls Co. Indian chief doll. 280,535, 9-10-85, Cl. D21-182.000.
Carlson, Ann, to Carlson Dolls Co. Indian princess doll. 280,536, 9-10-85, Cl. D21-182.000.
Carlson Dolls Co.: *See—*
Carlson, Ann, 280,535, Cl. D21-182.000.
Carlson, Ann, 280,536, Cl. D21-182.000.
Cartier, Inc.: *See—*
Bromley, R. Scott, 280,480, Cl. D6-559.000.
Cassaro, Michael J. Toy doll. 280,534, 9-10-85, Cl. D21-168.000.
Casull, Richard J. Belt buckle. 280,464, 9-10-85, Cl. D2-431.000.
Cerberus A.G.: *See—*
Meier, Otto; and Huber, Felix, 280,502, Cl. D13-35.000.
Claxton, Bruce A.; and Aithans, Richard K., to Motorola, Inc. Portable two-way radio or similar article. 280,507, 9-10-85, Cl. D14-68.000.
Cobb, Carl W. E., to Kettering Medical Center. Chest drainage equipment support cart. 280,563, 9-10-85, Cl. D34-17.000.
Collins, Norma. Storm door. 280,552, 9-10-85. Cl. D25-48.000.
Collins, Steven W.: *See—*
Marino, Jerry C.; and Collins, Steven W., 280,509, Cl. D14-102.000.
Conti, Rino; and Daenen, Robert H. C. M., to Dart Industries Inc. Cover for a food storage container or the like. 280,484, 9-10-85, Cl. D7-391.000.
Continental Industries, Inc.: *See—*
Mihojevich, Steven, 280,467, Cl. D3-76.000.
Cox, Pauline E. Book marker. 280,529, 9-10-85, Cl. D19-34.000.
CPG Products Corp.: *See—*
Hoel, Per; and Holland, Kathleen, 280,521, Cl. D21-13.000.
Cramer, Ronald G., to S. C. Johnson & Son, Inc. Dispensing container for air freshener. 280,548, 9-10-85, Cl. D23-150.000.
Daenen, Robert H. C. M.: *See—*
Conti, Rino; and Daenen, Robert H. C. M., 280,484, Cl. D7-391.000.
Dart Industries Inc.: *See—*
Conti, Rino; and Daenen, Robert H. C. M., 280,484, Cl. D7-391.000.
Dawson, Robert E.: *See—*
Miller, David C.; Dawson, Robert E.; Pendleton, Thomas J.; and Krapowicz, Jacob A., 280,468, Cl. D4-122.000.
Decra-Stone, Inc.: *See—*
Knutson, Lawrence M., 280,482, Cl. D7-29.000.
Dennison, Saul: *See—*
Seltzer, Samuel M.; and Dennison, Saul, 280,466, Cl. D3-40.000.
Diebold, Incorporated: *See—*
Hall, Richard B., 280,512, Cl. D14-106.000.
Drackett Company, The: *See—*
Lane, James; and Straker, Rod, 280,487, Cl. D9-376.000.
Lane, James; and Straker, Rod, 280,488, Cl. D9-376.000.
Drag Specialties, Inc.: *See—*
Stahel, Alwin J., 280,495, Cl. D12-126.000.
Edens, Glenn T.: *See—*
Moggridge, William G.; Paulsen, David C.; Edens, Glenn T.; and Hobson, Stephen R., 280,511, Cl. D14-106.000.
Edwards, William H. Guitar. 280,520, 9-10-85, Cl. D17-18.000.
Eiland, Harry F.; and Keith, Glen S., to Xerox Corporation. Dual mode document copier. 280,518, 9-10-85, Cl. D16-30.000.
Eisner, Alfred W.; and Schmitz, Willard H., to Kohler Co. Combined stairs and enclosure for a hydrotherapy spa. 280,551, 9-10-85, Cl. D24-38.000.
Engineering & Research Associates, Inc.: *See—*
Minney, Stephen C., and Harmony, Daniel C., 280,515, Cl. D15-146.000.
Epson Corporation: *See—*
Mori, Masahiko, 280,527, Cl. D18-22.000.
Erwin Lambeth, Inc.: *See—*
Alessandro, Sante G., 280,554, Cl. D26-110.000.
Essex Chair Company: *See—*
Testa, Stefano, 280,475, Cl. D6-384.000.
Fee, Robert W.: *See—*
Robbins, Richard J.; Fee, Robert W.; Miller, Vernon R.; and Hatch, Edwin B., 280,539, Cl. D22-25.000.
Robbins, Richard J.; Fee, Robert W.; Miller, Vernon R.; and Hatch, Edwin B., 280,540, Cl. D22-25.000.
Fender Musical Instruments Corporation: *See—*
Gressett, Charles A., Jr., 280,525, Cl. D17-21.000.
Gressett, Charles A., Jr.; Todd, Charles H., III; and Page, John F., 280,526, Cl. D17-21.000.
Page, John F., 280,522, Cl. D17-20.000.
Smith, Daniel J., 280,523, Cl. D17-20.000.
Smith, Daniel J., 280,524, Cl. D17-20.000.
Fieschi, Monique; and Galhaud, Marie-Jacqueline. Candle arrangement. 280,553, 9-10-85, Cl. D26-7.000.
Figgie International Inc.: *See—*
Aoki, Akio, 280,462, Cl. D2-361.000.
Fischer, Wolfgang; and Hilpert, Fritz, to International Business Machines Corporation. Printer. 280,513, 9-10-85, Cl. D14-111.000.
Fontaine, Gary. Sailboard mast track. 280,499, 9-10-85, Cl. D12-317.000.
Fukumoto, Masafumi, to Nisshin Chemical Industry Co., Ltd. Heat exchanger. 280,544, 9-10-85, Cl. D23-136.000.
Fukumoto, Masafumi, to Nisshin Chemical Industry Co., Ltd. Heat exchanger. 280,545, 9-10-85, Cl. D23-136.000.
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CLASS 76

42 4,539,871

CLASS 81

57.37 4,539,872
311 4,539,873
454 4,539,874

CLASS 82

1 C 4,539,875
32 4,539,876

CLASS 83

99 4,539,878
107 4,539,879
467 R 4,539,880
731 4,539,877
745 4,539,881

CLASS 84

1.03 4,539,882
1.22 4,539,883
1.24 4,539,884
1.25 4,539,885
267 4,539,886
314 R 4,539,887
380 B 4,539,888

CLASS 89

33.2 4,539,890
147 4,539,889

CLASS 91

49 4,539,891
391 R 4,539,892

CLASS 92

52 4,539,893
138 4,539,894
249 4,539,895

CLASS 98

1 4,539,896
49 4,539,897

CLASS 99

336 4,539,898
347 4,539,899
353 4,539,900
393 4,539,901
454 4,539,902
470 4,539,903
618 4,539,904

CLASS 101

93.05 4,539,905
93.14 4,539,906
248 4,539,907
426 4,539,908

CLASS 102

275.2 4,539,909
374 4,539,911

CLASS 105

8 R 4,539,912

CLASS 106

97 4,540,438
109 4,540,439
148 4,540,440
300 4,540,441

CLASS 108

7 4,539,913
94 4,539,914

CLASS 110

101 R 4,539,915
203 4,539,916
256 4,539,917
266 4,539,918
331 4,539,919

CLASS 111

2 4,539,920
52 4,539,921

CLASS 112

221 4,539,922
224 4,539,923
262.2 4,539,924
314 4,539,925

CLASS 114

39 4,539,926
89 4,539,927

CLASS 116

34 R 4,539,928
221 4,539,929

CLASS 118

300 4,539,930
404 4,539,931
697 4,539,932
719 4,539,933
723 4,539,934

CLASS 119

1 4,539,935
29 4,539,936
4,539,937
75 4,539,938

CLASS 122

4 D 4,539,939
32 4,539,940

CLASS 123

18 R 4,539,941
41.05 4,539,943
41.06 4,539,944
41.1 4,539,942
41.31 4,539,945
48 A 4,539,946
52 M 4,539,947
65 BA 4,539,948
73 AD 4,539,949
79 C 4,539,950
90.17 4,539,951
90.36 4,539,952
90.41 4,539,953
188 VA 4,539,954
339 4,539,955
357 4,539,956
425 4,539,957
440 4,539,958
456 4,539,959
463 4,539,960
468 4,539,961
470 4,539,962
494 4,539,963
509 4,539,964
514 4,539,965
557 4,539,966
585 4,539,967

CLASS 124

35 A 4,539,968
57 4,539,969
90 4,539,970

CLASS 125

11 H 4,539,971
16 R 4,539,972

CLASS 126

43 4,539,973
409 4,539,974
439 4,539,975

CLASS 128

6 4,539,976
68 4,539,977
71 4,539,978
75 4,539,979
79 4,539,980
92 B 4,539,981
156 4,539,982
201.19 4,539,983
204.23 4,539,984
205.13 4,539,985
4,539,986
303.1 4,539,987
314 4,539,988
328 4,539,989
335 4,539,990
419 PG 4,539,991
4,539,992
421 4,539,993
635 4,539,994
639 4,539,995
640 4,539,996
667 4,539,997
675 4,539,998
696 4,539,999
4,540,000
706 4,540,001
734 4,540,002

CLASS 130

27 T 4,540,003

CLASS 131

277 4,540,004
336 4,540,005

CLASS 132

39 4,540,006
88.5 4,540,007

CLASS 133

5 A 4,540,008

CLASS 134

2 4,540,442
4,540,443
3 4,540,444
21 4,540,445
167 R 4,540,009

CLASS 135

99 4,540,010

CLASS 136

251 4,540,843

CLASS 137

15 4,540,011
72 4,540,012
75 4,540,013
123 4,540,014
240 4,540,015
244 4,540,016
355.12 4,540,017
540 4,540,018
557 4,540,019
596.15 4,540,020
614.05 4,540,021
625.17 4,540,023
625.21 4,540,024
625.3 4,540,022
625.32 4,540,025
848 4,540,027
862 4,540,026

CLASS 139

453 4,540,028

CLASS 140

92.2 4,540,029
93 R 4,540,030

CLASS 144

2 R 4,540,031
3 D 4,540,032
34 R 4,540,033

CLASS 148

1.5 4,540,446
2 4,540,447
6.15 R 4,540,448
31.5 4,540,449
31.55 4,540,453
171 4,540,450
173 4,540,451
175 4,540,452

CLASS 150

137 4,540,034

CLASS 152

367 4,540,035

CLASS 156

62.2 4,540,454
79 4,540,455
159 4,540,456
182 4,540,457
312 4,540,458
504 4,540,459
571 4,540,460
624 4,540,461
630 4,540,462
4,540,463
639 4,540,464
642 4,540,465
643 4,540,466

CLASS 162

4 4,540,467
49 4,540,468
199 4,540,469

CLASS 164

323 4,540,036
466 4,540,037
499 4,540,038

CLASS 165

2 B1 4,076,071
9.4 4,540,039
12 4,540,040
45 4,540,041
96 4,540,042
104.12 4,540,043
149 4,540,044
164 4,540,045

CLASS 166

55 4,540,046
153 B1 3,910,349
188 4,540,047
214 4,540,048
272 4,540,049
4,540,050
278 4,540,051
303 4,540,052
348 4,540,053

CLASS 172

292 4,540,054

CLASS 174

3 4,540,844
7 4,540,845
38 4,540,846

48 4,540,847
152 R 4,540,848

CLASS 175

323 4,540,055
393 4,540,056

CLASS 177

154 4,540,057
255 4,540,058

CLASS 179

2 A 4,540,851
2 AM 4,540,849
2 DP 4,540,850
18 FA 4,540,852
4,540,853
4,540,854
84 R 4,540,855
89 4,540,856
175.21 4,540,857

CLASS 180

141 4,540,059
179 4,540,060
215 4,540,061
227 4,540,062
247 Re.31,981

CLASS 181

135 4,540,063
227 4,540,064

CLASS 182

63 4,540,065

CLASS 188

71.5 4,540,067
71.9 4,540,066
73.39 4,540,068
218 A 4,540,069
380 4,540,070

CLASS 190

121 4,540,071

CLASS 192

4 A 4,540,072
4,540,073
53 G 4,540,074
58 B 4,540,076
58 R 4,540,075
70.12 4,540,077
87.11 4,540,078
109 R 4,540,079

CLASS 193

40 4,540,080

CLASS 194

4 C 4,540,081

CLASS 198

358 4,540,082
465.1 4,540,083
468.3 4,540,084
519 4,540,085
536 4,540,086
621 4,540,087
803.15 4,540,088

CLASS 200

5 R 4,540,858
6 B 4,540,859
83 C 4,540,860
144 B 4,540,861
4,540,862
4,540,863
302.2 4,540,864
340 4,540,865

CLASS 202

175 4,540,471
180 4,540,470
349 4,539,910

CLASS 204

28 4,540,472
52 R 4,540,473
67 4,540,474
4,540,475
96 4,540,476
242 4,540,477
297 W 4,540,478
427 4,540,479

CLASS 206

219 4,540,089
387 4,540,090
494 4,540,091

CLASS 208

44 4,540,480
215 4,540,481
4,540,482
216 PP 4,540,483

CLASS 209

5 4,540,484
323 4,540,485

CLASS 210

198.2 4,540,486
264 4,540,487
268 4,540,488
287 4,540,489
323.2 4,540,490
619 4,540,491
651 4,540,492
669 4,540,493
750 4,540,494
774 4,540,495

CLASS 211

4 4,540,092
59.1 4,540,093
113 4,540,094

CLASS 212

177 4,540,096
187 4,540,095
196 4,540,097

CLASS 215

216 4,540,098
252 4,540,099
4,540,100
4,540,101
344 4,540,102

CLASS 219

10.77 4,540,866
61.3 4,540,879
121 LW 4,540,867
121 PM 4,540,868
124.34 4,540,869
126 4,540,870
137.63 4,540,871
159 4,540,872
200 4,540,873
279 4,540,874
364 4,540,875
405 4,540,876
497 4,540,877
545 4,540,878

CLASS 220

203 4,540,103
224 4,540,104
359 4,540,105

CLASS 221

13 4,540,106
194 4,540,107

CLASS 223

102 4,540,108

CLASS 225

1 4,540,109

CLASS 227

8 4,540,110
4,540,111
152 4,540,112

CLASS 228

1.1 4,540,113
37 4,540,114
123 4,540,115

CLASS 229

38 4,540,116

CLASS 232

7 4,540,117

CLASS 235

487 4,540,880

CLASS 236

44 C 4,540,118

CLASS 238

10 R 4,540,119

CLASS 239

1 4,540,120
13 4,540,121
88 4,540,122
102 4,540,123
223 4,540,124
232 4,540,125
533.4 4,540,126

CLASS 241

1 4,540,127
34 4,540,129
37.5 4,540,128

CLASS 242

18 G 4,540,130
55 4,540,131
67.1 R 4,540,132
71.8 4,540,133
74 4,540,134
84.51 R 4,540,135
106 4,540,136
107.6 4,540,137
131 4,540,138

CLASS 244

3.19 4,540,139
4,540,140
17.19 4,540,141
102 R 4,540,142
130 4,540,143
135 A 4,540,144
152 4,540,145

CLASS 248

201 4,540,146
352 4,540,147
406.2 4,540,148
669 4,540,149

CLASS 249

20 4,540,150
93 4,540,151
184 4,540,152

CLASS 250

201 4,540,881
255 4,540,882
262 4,540,883
282 4,540,884
310 4,540,885
554 4,540,886
561 4,540,887

CLASS 251

11 4,540,153
129.15 4,540,154
129.20 4,540,155
309 4,540,156
315 4,540,157
367 4,540,158

CLASS 252

8.5 A 4,540,496
8.55 D 4,540,498
8.75 4,540,499
8.8 4,540,497
62.58 4,540,500
70 4,540,501
4,540,502
78.3 4,540,503
99 4,540,504
106 4,540,505
174.12 4,540,506
174.23 4,540,507
180 4,540,508
184 4,540,509
315.3 4,540,510
321 4,540,511
629 4,540,512

CLASS 254

228 4,540,159

CLASS 256

19 4,540,160

CLASS 260

112.5 R 4,540,513
239 D 4,540,514
239.3 B 4,540,517
239.3 R 4,540,515
4,540,516
242.2 4,540,518
380 4,540,519
396 N 4,540,520
459 A 4,540,521
465 D 4,540,523
465 E 4,540,522
465.4 4,540,524
512 C 4,540,525
936 4,540,526
949 4,540,527

CLASS 261

91 4,540,528
4,540,529
92 4,540,530
141 4,540,531

CLASS 264

1.1 4,540,532
1.4 4,540,533
2.2 4,540,534
44 4,540,535
102 4,540,536
171 4,540,537
211 4,540,538
269 4,540,539
272.11 4,540,540
328.2 4,540,541
524 4,540,542
526 4,540,543
532 4,540,544

CLASS 266

95 4,540,161
146 4,540,162
201 4,540,163

CLASS 269

88 4,540,164
325 4,540,165

CLASS 271

3.1 4,540,166
11 4,540,167
101 4,540,168
127 4,540,169
259 4,540,170

CLASS 272

118 4,540,171
133 4,540,172
139 4,540,173

CLASS 273

138 R 4,540,174
139 4,540,175
148 B 4,540,176
153 S 4,540,177
169 4,540,178
186 C 4,540,179
313 4,540,180
352 4,540,181
392 4,540,182

CLASS 277

1 4,540,183
12 4,540,184
174 4,540,185
195 4,540,186

CLASS 279

1 L 4,540,187

CLASS 280

5 A 4,540,191
6 R 4,540,188
270 4,540,189
278 4,540,190
282 4,540,192
284 4,540,193
491 B 4,540,194
610 4,540,195
646 4,540,196
697 4,540,197
814 4,540,198

CLASS 282

14 4,541,115

CLASS 285

27 4,540,199
101 4,540,201
184 4,540,202
226 4,540,203
231 4,540,204
329 4,540,205
332.4 4,540,200

CLASS 290

1 R 4,540,888

CLASS 292

66 4,540,206
341.17 4,540,207
341.19 4,540,208

CLASS 294

74 4,540,209
82.34 4,540,210
88 4,540,211
4,540,212

CLASS 296

37.5 4,540,213
39 R 4,540,214
218 4,540,215

CLASS 297

238 4,540,216
391 4,540,217
467 4,540,218
487 4,540,219

CLASS 301

125 4,540,220

CLASS 307

2 4,540,889
40 4,540,890
118 4,540,891
130 4,540,892
248 4,540,893
252 Q 4,540,895
254 4,540,894
264 4,540,896
268 4,540,897
269 4,540,898
270 4,540,899
289 4,540,900
311 4,540,901
352 4,540,902
465 4,540,903
473 4,540,904

CLASS 308

5 R 4,540,221

CLASS 310

12 4,540,905
67 R 4,540,906
68 D 4,540,907
326 4,540,908
370 4,540,909

CLASS 312

257 R 4,540,222

CLASS 313

11.5 4,540,910
44 4,540,911
142 4,540,912
466 4,540,913
4,540,914
486 4,540,915

CLASS 315

16 4,540,916
291 4,540,917
371 4,540,918
384 4,540,919

CLASS 318

7 4,540,920
254 4,540,921
490 4,540,922
561 4,540,923
568 4,540,924
602 4,540,925
609 4,540,926
696 4,540,927
4,540,928

CLASS 320

2 4,540,929

CLASS 322

4 4,540,930

CLASS 323

264 4,540,931
266 4,540,932
271 4,540,933
341 4,540,934

CLASS 324

52 4,540,935
61 P 4,540,936
96 4,540,937
121 R 4,540,938
127 4,540,939
133 4,540,940
221 4,540,941
326 4,540,942
4,540,943

CLASS 328

22 4,540,944
134 4,540,945
167 4,540,946

CLASS 329

50 4,540,947
122 4,540,948

CLASS 330

85 4,540,949
267 4,540,950
4,540,951
279 4,540,952
284 4,540,953
286 4,540,954

CLASS 331

107 DP 4,540,955
116 R 4,540,956

CLASS 332

10 4,540,957
16 R 4,540,958

CLASS 333

21 R 4,540,959
228 4,540,960

CLASS 335

16 4,540,961
131 4,540,962
133 4,540,963
205 4,540,964
259 4,540,965
297 4,540,966

CLASS 336

84 C 4,540,967

CLASS 337

31 4,540,968
232 4,540,969
297 4,540,970

CLASS 338

21 4,540,971
26 4,540,972

CLASS 339

3 S 4,540,223
14 R 4,540,224
16 RC 4,540,225
17 CF 4,540,226
17 F 4,540,227
45 R 4,540,236
74 R 4,540,228
75 M 4,540,229
89 M 4,540,230
94 C 4,540,231
198 G 4,540,232
258 R 4,540,233
259 F 4,540,235
259 R 4,540,234

CLASS 340

347 AD 4,540,974
347 DD 4,540,973
388 4,540,975
539 4,540,976
552 4,540,977
554 4,540,978
576 4,540,979
586 4,540,980
618 4,540,981
743 4,540,982
772 4,540,983
825 4,540,984

CLASS 343

5 DP 4,540,985
6.8 R 4,540,986
18 B 4,540,987
728 4,540,988
900 4,540,989

CLASS 346

75 4,540,990
76 PH 4,540,991
4,540,992
4,541,042
139 C 4,540,995
139 R 4,540,993
4,540,994
140 R 4,540,996
4,540,997
212 4,540,998
216 4,540,999

CLASS 350

3.70 4,540,246
3.71 4,540,247
96.15 4,540,237
146 4,540,238
235 4,540,239
255 4,540,240
261 4,540,241
335 4,540,242
337 4,540,243
354 4,540,244
358 4,540,245
414 4,540,248
426 4,540,249
438 4,540,250
611 4,540,251
634 4,540,252

CLASS 351

211 4,540,253
212 4,540,254

CLASS 352

44 4,540,255
239 4,540,256

CLASS 353

103 4,540,257

CLASS 354

62 4,540,258
109 4,540,259
173.1 4,540,260
173.11 4,540,261
195.13 4,540,262
304 4,540,263
400 4,540,264
417 4,540,265
458 4,540,266

CLASS 355

3 FU 4,540,267
3 R 4,540,268
4,540,269
4,540,270
4,540,271
4 4,540,272
8 4,540,273
14 FU 4,540,274
14 TR 4,540,275
38 4,540,276
53 4,540,277
55 4,540,278
69 4,540,279

CLASS 356

246 4,540,280
325 4,540,281
328 4,540,282
336 4,540,283
350 4,540,284
432 4,540,285
445 4,540,286

CLASS 357

15 4,541,000
23.4 4,541,001
41 4,541,006
51 4,541,002
74 4,541,003
81 4,541,004
4,541,005

CLASS 358

3 4,541,007
13 4,541,008
4,541,009
44 4,541,010
106 4,541,011
133 4,541,012
142 4,541,013
166 4,541,014
212 4,541,015
228 4,541,016
295 4,541,017
314 4,541,018

CLASS 360

15 4,541,019
22 4,541,020
35.1 4,541,021
72.2 4,541,022
73 4,541,023
85 4,541,024
99 4,541,025
121 4,541,026
137 4,541,027
4,541,028

CLASS 361

31 4,541,029
56 4,541,030
67 4,541,031
331 4,541,032
333 4,541,033
405 4,541,034
414 4,541,035
426 4,541,036
433 4,541,037

CLASS 362

352 4,541,038

CLASS 363

21 4,541,039
37 4,541,040
41 4,541,041

CLASS 364

200 4,541,043
4,541,044
4,541,045
4,541,046
4,541,047
4,541,048
300 4,541,056
408 4,541,057
424 4,541,049
4,541,050
4,541,051
431.07 4,541,052
466 4,541,053
474 4,541,054
4,541,055
483 4,541,058
508 4,541,059
513 4,541,060
4,541,062
518 4,541,061
550 4,541,063
552 4,541,064
571 4,541,065
580 4,541,066
716 4,541,067
825 4,541,068
900 4,541,069
4,541,070
4,541,071

CLASS 365

29 4,541,072
156 4,541,073
178 4,541,074
189 4,541,075
190 4,541,076
210 4,541,077
230 4,541,078

CLASS 366

7 4,540,287
145 4,540,288
274 4,540,289
286 4,540,290

CLASS 367

19 4,541,079
94 4,541,080
168 4,541,081

CLASS 368

28 4,540,291
29 4,540,292

CLASS 369

44 4,541,082
4,541,083
45 4,541,084
65 4,541,085
271 4,541,086

CLASS 370

62 4,541,087
110.2 4,541,088

CLASS 371

8 4,541,089
21 4,541,090
39 4,541,091
4,541,092
40 4,541,093
68 4,541,094
69 4,541,095

CLASS 372

59 4,541,096
87 4,541,097

CLASS 373

36 4,541,098
72 4,541,099

CLASS 374

130 4,540,293

CLASS 375

10 4,541,100
28 4,541,101
30 4,541,102
32 4,541,103
114 4,541,104

CLASS 376

364 4,540,545

CLASS 377

19 4,541,105

CLASS 378

099 4,541,106
146 4,541,107
196 4,541,108

CLASS 381

15 4,541,109
46 4,541,110
51 4,541,111
113 4,541,112

CLASS 382

4 4,541,113
8 4,541,114
49 4,541,116

CLASS 383

64 4,541,117

CLASS 384

273 4,540,294

CLASS 400

120 4,540,295
121 4,540,296
625 4,540,297
635 4,540,298
708 4,540,299

CLASS 401

107 4,540,300
146 4,540,301
173 4,540,302
258 4,540,303

CLASS 403

12 4,540,304
13 4,540,305
93 4,540,306
190 4,540,307
219 4,540,308
374 4,540,309

CLASS 404

25 4,540,310
72 4,540,311
110 4,540,312

CLASS 405

78 4,540,313
227 4,540,314
264 4,540,315
4,540,316

CLASS 406

112 4,540,317

CLASS 408

9 4,540,318
100 4,540,319

CLASS 409

232 4,540,320

CLASS 411

310 4,540,321
338 4,540,322

CLASS 413

6 4,540,323

CLASS 414

20 4,540,324
96 4,540,325
217 4,540,326
352 4,540,327
538 4,540,328
545 4,540,329
641 4,540,330
730 4,540,331
744 R 4,540,332

CLASS 415

2 A 4,540,333
72 4,540,334
129 4,540,335
141 4,540,337
174 4,540,336
219 C 4,540,338

CLASS 416

92 4,540,339
145 4,540,340
157 R 4,540,341

CLASS 417

40 4,540,342
218 4,540,343
240 4,540,344
269 4,540,345
273 4,540,346
310 4,540,347
383 4,540,348
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78 4,540,570
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94 4,540,569
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	4,540,133		4,540,399		4,539,769		4,539,949		4,540,383		4,541,013
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	4,539,774		4,540,667		4,540,477		4,540,460		4,540,078		4,540,256
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